CITY OF PITTSBURG

PITTSBURG/BAY POINT BART MASTER PLAN

DRAFT ENVIRONMENTAL IMPACT REPORT

SCH No. 2010122023

Prepared for:

CITY OF PITTSBURG
PLANNING DIVISION
65 CIVIC AVENUE
PITTSBURG, CA 94565

Prepared by:

PMC®

2729 PROSPECT PARK DRIVE, SUITE 220
RANCHO CORDOVA, CA 95670

JUNE 2011

City of Pittsburg

Development Services Department
Planning Division
65 Civic Avenue
Pittsburg, CA 94565-3814

Notice of Availability

Pittsburg/Bay Point BART Master Plan Draft EIR
State Clearinghouse No. 2010122023

June 17, 2011

LEAD AGENCY: City of Pittsburg

PROJECT TITLE: Pittsburg/Bay Point BART Master Plan

PROJECT LOCATION: The proposed Master Plan would cover an area in the City of Pittsburg that is approximately 50.6 acres in size, encompassing the whole of Assessor's Parcel Numbers (APN) 097-160-044, -45, and -049 as well as the majority of APN 097-160-041. The only portion of APN 097-160-041 that lies outside the Master Plan area is the northern 2.5 acres (approximate) containing the approach and exit ramps for the existing Bay Area Rapid Transit (BART) station. The approach and exit ramps are not a part of the project and would not be modified by the proposed Master Plan. The project is located approximately 700 feet southwest of the intersection of State Route (SR) 4 and Bailey Road and is bounded by SR 4 to the north, the Oak Hills Shopping Center to the east, West Leland Road to the south, and the Alves Ranch project area to the west. The city boundary is located along SR 4, just north of the Master Plan area. The area north of SR 4 lies within unincorporated Contra Costa County in the community of Bay Point.

PROJECT DESCRIPTION: The proposed project consists of a Master Plan outlining land use and design requirements within a 50.6-acre portion of the City of Pittsburg in the vicinity of the Pittsburg/Bay Point BART Station—the current eastern terminus of Bay Area Rapid Transit (BART) in Pittsburg. Approximately half of the Master Plan area is currently owned by BART, and the remaining half is owned by West Coast Home Builders (WCHB). The Master Plan would be expected to result in development of medium- and high-density multi-family residential uses as well as a number of retail uses, two new parking garages, a transit plaza and bus shelter adjacent to the BART station, and a number of “flex” uses which can be any mix of retail, commercial, or quasi-public uses, depending on market conditions at the time of development. Overall, the Master Plan is expected to result in the addition of 1,168 dwelling units and 146,362 square feet of nonresidential uses employing approximately 1,300 people.

The Master Plan includes specific design guidelines for structures, roadways, and an interconnected network of pedestrian/bicycle paths and facilities. Also included is a 0.4-acre park, an expanded stormwater detention basin, numerous landscape corridors along roads, and private recreation/open space.

SIGNIFICANT ENVIRONMENTAL EFFECTS: The City of Pittsburg has prepared a Draft Environmental Impact Report (EIR) to address the specific environmental effects of implementing the Master Plan. The Draft EIR consists of a focused analysis of the following environmental issue areas that may be impacted by the project:

- Land Use
- Transportation and Circulation
- Noise
- Air Quality
- Geology and Soils
- Hazards
- Hydrology and Water Quality
- Biological and Natural Resources
- Aesthetics
- Public Services and Utilities
- Recreation
- Population and Housing
- Greenhouse Gas and Climate Change
- Cumulative Impacts
- Significant Irreversible Environmental Changes
- Growth Inducing Impacts

Listed hazardous waste sites, hazardous materials users and other associated hazardous material sites (including sites identified under Section 65962.5 of the Government Code) that are known to be present in the project area are identified in Section 4.3 (Hazards) of the Draft EIR.

PUBLIC REVIEW PERIOD/STATUS: A **45-day public review period** will be provided to receive written comments on the adequacy of the Draft EIR. The comment period will start on **June 17, 2011,** and end on **August 1, 2011**. Written comments should be sent to the following address:

City of Pittsburg
Planning Division
Leigha Schmidt
65 Civic Avenue
Pittsburg, CA 94565

PUBLIC MEETING: A public meeting to receive comments on the adequacy of the Draft EIR will be held on **Tuesday, June 28, at 7 p.m. at City Hall, 65 Civic Avenue, 3rd Floor Council Chambers** before the Planning Commission.

AVAILABILITY OF THE DRAFT EIR: Copies of the Draft EIR are available for review at the following location:

City of Pittsburg
Planning Division
65 Civic Avenue
Pittsburg, CA 94565
Phone: (925) 252-4920

The Draft EIR may also be reviewed on the City's website (http://www.ci.pittsburg.ca.us/index.aspx?page=217). Referenced material used in the preparation of the Draft EIR may be reviewed upon request to the Planning Division.

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JUNE 2011

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1.0 Introduction

This section summarizes the purpose of the Environmental Impact Report (EIR), describes the environmental procedures that are to be followed according to state law, discusses the intended uses of the EIR, discusses the project's relationship to the Pittsburg General Plan, describes the EIR scope and organization, identifies a contact person for the project, and provides definitions of impact terminology, commonly used terms, and abbreviations used throughout the EIR.

1.1 BACKGROUND AND PURPOSE

This EIR has been prepared, in conformance with the provisions of the California Environmental Quality Act, California Public Resources Code, Division 13, Environmental Quality (CEQA) and Title 14, California Code of Regulations, Chapter 3, Guidelines for Implementation of the California Environmental Quality Act (State CEQA Guidelines), to evaluate the environmental effects of the proposed Pittsburg/Bay Point BART Master Plan project (proposed Master Plan; proposed project). The proposed Master Plan will guide development on the subject parcels, currently containing a Bay Area Rapid Transit (BART) station and associated parking areas and two vacant parcels, totaling approximately 50.6 acres. See Section 3.0 of this Draft EIR for a more detailed project description.

The City of Pittsburg, acting as the lead agency, has prepared this Draft EIR (DEIR) to provide the public, responsible agencies, and trustee agencies with information about the potential environmental effects of the proposed Master Plan. As described in State CEQA Guidelines Section 15121(a), an EIR is a public informational document that assesses potential environmental effects of the proposed project and identifies mitigation measures and alternatives to the proposed project that could reduce or avoid its adverse environmental impacts. Public agencies are charged with the duty to consider and minimize environmental impacts of proposed development, where feasible, and obligated to balance a variety of public objectives including economic, environmental, and social factors.

CEQA requires the preparation of an EIR prior to approving any project which may have a significant effect on the environment. For the purposes of CEQA, the term "project" refers to the whole of an action that has the potential for resulting in a direct physical change or a reasonably foreseeable indirect physical change in the environment (State CEQA Guidelines Section 15378[a]). With respect to the proposed Master Plan, the City has determined that the proposed development constitutes a project within the definition of CEQA.

1.2 TYPE OF DOCUMENT

The State CEQA Guidelines identify several types of EIRs, each applicable to different project circumstances. This EIR has been prepared as a program EIR, pursuant to State CEQA Guidelines Section 15161. A program EIR is prepared for a series of actions that can be categorized as one project and are related. In this case, the proposed Master Plan will guide development on a single contiguous site that may be developed in several phases over time. As a program such as the Master Plan does not include detailed information for development, the analysis of a program EIR can be formulated using the best available information but not necessarily to the degree of a typical project-level analysis.

Ultimately, the EIR is used by the City as a tool in evaluating the proposed project's environmental impacts and can be further used to modify, approve, or deny approval of the proposed project based on the analysis provided in the EIR. Furthermore, future proposed development as a result of the proposed Master Plan will be subject to possible additional analysis as details of those future phases becomes available, pursuant to State CEQA Guidelines Section 15168.

1.3 INTENDED USES OF THE EIR

This EIR is intended to evaluate the environmental impacts of the project to the greatest extent possible. This EIR, in accordance with State CEQA Guidelines Section 15126, should be used as the primary environmental document to evaluate all subsequent planning and permitting actions associated with the project. The direct action considered by this EIR is the approval by the City of Pittsburg of a Master Plan. However, subsequent actions are expected to occur as a result of this approval, including but not limited to the following:

- Rezoning to Master Plan Overlay District
- Amendments to the Mixed Use District regulations set forth in Pittsburg Municipal Code (PMC) chapter 18.53
- Authorization of a Joint Powers Authority (JPA) Agreement by and between the City, BART and other applicable parties
- Design Review
- Tentative Subdivision Map
- Final Map
- Grading Permit(s)
- Development Permit
- Improvement Plans
- Building Permit(s)
- Occupancy Permit(s)

BAY AREA RAPID TRANSIT (BART)

- Approval of future development proposals
- Creation of a Joint Exercise of Powers Agreement (JPA) between BART, the City of Pittsburg, and the Redevelopment Agency of the City of Pittsburg or other relevant party

STATE WATER QUALITY CONTROL BOARD

- National Pollutant Discharge Elimination System (NPDES) Construction Activity General Permit – Requires the applicant to file a public Notice of Intent to discharge stormwater and to prepare and implement a stormwater pollution prevention plan (SWPPP)
- NPDES General Permit for Stormwater Discharges – Requires that discharges of pollutants from areas of new development be reduced to the maximum extent practicable in order to protect receiving waters and uphold water quality standards

1.4 RELATIONSHIP TO THE PITTSBURG GENERAL PLAN

The Pittsburg General Plan was adopted in 2001. Various elements have been updated since that time, with the latest updates occurring in July 2010. The General Plan is the City's overall guide for the use of the City's resources, expresses the development goals of the community, and is the foundation upon which all land use decisions are made. Adopted General Plan Goals and Policies support the development of the Master Plan for high density, mixed use development in close proximity to the existing Pittsburg/Bay Point BART Station that is pedestrian and bicycle friendly, incorporates a mix of uses, and contains high intensity and high density residential uses (2-G-4, 2-P-94, 4-P-59, 13-P-1.4A, and 13-P-1.4E).

This EIR provides an analysis of environmental effects specifically associated with the proposed Master Plan. Consistent with State CEQA Guidelines Section 15183, this EIR addresses environmental effects that are peculiar to the project and utilizes mitigation measures that are based on adopted City development policies and standards as well as current state and federal regulations to mitigate anticipated impacts. The proposed project's consistency with applicable General Plan policies is discussed under each of the subject categories in Sections 4.1 through 4.12. Potential effects of implementing the proposed project are identified, including cumulative effects that may occur as a result of the proposed project in conjunction with other projects in the vicinity (see Section 4.0, Assumptions). Where potentially significant effects are identified, mitigation measures are recommended to lessen or reduce identified impacts.

1.5 ORGANIZATION AND SCOPE

Sections 15122 through 15132 of the State CEQA Guidelines identify the content requirements for Draft and Final EIRs (FEIRs). An EIR must include a description of the environmental setting, an environmental impact analysis, mitigation measures, alternatives, significant irreversible environmental changes, growth-inducing impacts, and cumulative impacts. The environmental issues addressed in the DEIR were established through review of environmental documentation developed for the site, environmental documentation for nearby projects, and public agency responses to the Notice of Preparation (NOP) (**Appendix B**). Based upon these comments, agency consultation and review of the project application, the City determined the scope for this EIR.

This DEIR is organized in the following manner:

SECTION 1.0 – INTRODUCTION

Section 1.0 provides an introduction and overview describing the intended use of this EIR and the review and certification process.

SECTION 2.0 – EXECUTIVE SUMMARY

This section summarizes the characteristics of the proposed project and provides a concise summary matrix of the project's environmental impacts and associated mitigation measures.

SECTION 3.0 – PROJECT DESCRIPTION

This section provides a detailed description of the proposed project, including intended objectives, background information, and physical and technical characteristics.

SECTION 4.0 – ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

Section 4.0 contains an analysis of environmental topic areas as identified below. Each subsection within Section 4.0 (4.1 through 4.12) contains a description of the existing setting of the project area, identifies standards of significance, identifies project-related impacts, and recommends mitigation measures.

The following major environmental topics are addressed in this section:

Aesthetics: This section describes the existing landscape characteristics, considers consistency of the project with applicable General Plan policies, and analyzes the project with regard to the City's Zoning Ordinance relative to viewsheds.

Air Quality: This section discusses local and regional air quality impacts associated with project implementation. Both short-term construction-related impacts and long-term operational air quality impacts are examined. This section also discusses the health risk assessment prepared for the project, which evaluates the potential project impacts on human health.

Biological and Natural Resources: This section examines the project's potential impacts on habitat, vegetation, and wildlife. The analysis emphasizes the potential degradation or elimination of important habitat and the impacts on listed, proposed, and candidate threatened and endangered species.

Geology and Soils: This section describes the existing geologic and soil conditions of the project site. Potential geologic or soil stability issues associated with the project are examined.

Greenhouse Gases: The section discusses global climate change and greenhouse gas emissions. Also included is a discussion of the project's contribution to cumulative greenhouse gases and the likely effects of those gases on the environment.

Hazards: This section assesses the likelihood for the presence of hazardous materials and hazardous conditions on the project site and in the project area, and evaluates their potential impact on human health.

Hydrology and Water Quality: This section describes the existing hydrologic conditions of the project area and provides information on existing surface water and groundwater conditions. In addition, construction and operational water quality impacts of the project on local hydrological conditions, including drainage areas, groundwater quality and supply, and changes in drainage flow rates, are examined.

Land Use and Planning: This section describes the existing land use characteristics of the project area and identifies land use designations, zoning, and relevant General Plan land use policies. This section also addresses land use impacts associated with implementation of the project including project compatibility with surrounding land uses, consistency with City land use goals and policies, potential land use conflicts, land use patterns, and impacts to adjacent uses.

Noise: This section describes the existing noise setting on the project site as well as noise impacts anticipated to result from construction and operation of the proposed project. Specific noise sources evaluated for this analysis include construction activity, mechanical equipment, on-site circulation, and off-site traffic and on-site noise source impacts to sensitive receptors.

Population, Housing, and Employment: This section describes the existing demographic and housing conditions of the project area and surrounding area. General Plan and Housing Element provisions associated with the proposed project are also identified. The analysis focuses on the direct and indirect environmental effects associated with population and housing.

Public Services and Utilities: This section describes existing public services and utilities available to serve the project and identifies any expansions of capacity or services that will be necessary to meet demands generated by the proposed project. This section includes a discussion of fire, police, schools, and other public services as well as key utilities such as water supply, wastewater (sewer), and solid waste.

Recreation: This section describes existing recreational resources available to serve the project and identifies any detrimental effects on those resources as a result of the project, including the environmental effects that would result from provision of additional recreational resources if required.

Transportation and Traffic: This section addresses impacts on the local and regional road system and proposed internal circulation patterns. In addition, this section assesses impacts on transit, bicycle, and pedestrian facilities.

SECTION 5.0 – CUMULATIVE IMPACTS SUMMARY

This section discusses the cumulative impacts associated with the proposed project. As required by CEQA Section 15130, an EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable.

SECTION 6.0 – ALTERNATIVES TO THE PROJECT

CEQA Guidelines Section 15126.6 requires that an EIR describe a range of reasonable alternatives to the project that could feasibly attain the basic objectives of the project and avoid and/or lessen the environmental effects of the project. This alternatives analysis provides a comparative analysis between the project and the selected alternatives, which include:

- Under Alternative 1, the No Project, No Build Alternative scenario, the proposed project site is assumed to remain in its current condition as undeveloped land and surface parking for the BART station.
- Under Alternative 2, the West Coast Home Builders site would be constructed as proposed, but the BART properties would remain in their current state.
- Under Alternative 3, the proposed Master Plan would be constructed but building heights would be limited to three stories, except for the parking garages, which would remain at their proposed height of five and six stories.

SECTION 7.0 – LONG-TERM IMPLICATIONS OF THE PROJECT

This section contains discussions and analysis of various topical issues mandated by CEQA. These include significant environmental effects that cannot be avoided if the project is implemented, irreversible environmental changes, and growth-inducing impacts.

SECTION 8.0 – REPORT PREPARERS

This section lists all authors and agencies that assisted in the preparation of the report by name, title, and company or agency affiliation.

APPENDICES

This section includes all notices and other procedural documents pertinent to the EIR, as well as all technical material prepared to support the analysis. All appendices are located in Volume II, Technical Appendices, of this EIR.

Effects Not Found to Be Potentially Significant

Typically, an EIR evaluates project or program effects on environmental issues listed in the Environmental Checklist Form, which is in Appendix G of the CEQA Guidelines. The NOP for the EIR included an Initial Study that identified potential environmental issues which were generally consistent with those found in the Environmental Checklist. Based on preliminary evaluation associated with preparation of the NOP and the Initial Study, the City determined that the proposed project would not have a potential effect on agricultural and forest resources, cultural resources, and mineral resources. As such, these issues are not discussed in this DEIR, save for recreation, which was included following a request by the Planning Commission to address possible impacts in that subject area. No other issues were scoped out from analysis in the EIR by the NOP and Initial Study.

1.6 ENVIRONMENTAL REVIEW PROCESS

The review and certification process for the EIR involves the following procedural steps:

NOTICE OF PREPARATION AND INITIAL STUDY

In accordance with Section 15082 of the CEQA Guidelines, the City released a Notice of Preparation (NOP) of an EIR and an Initial Study for the project on December 7, 2010 (SCH# 2010122023). The NOP and Initial Study are included in **Appendix B**. The City was identified as the lead agency for the proposed project. This notice was circulated to the public, local, state, and federal agencies, and other interested parties to solicit comments on the proposed project. The 30-day comment period closed on January 7, 2011. A scoping meeting was held on December 14, 2010, at Pittsburg City Hall to solicit input from interested agencies and the public. Concerns raised in response to the NOP and at the scoping meeting were considered during preparation of the DEIR.

The City received comment letters on the NOP for the Pittsburg/Bay Point BART Master Plan DEIR from the following federal, state, and local agencies and interested parties:

TABLE 1.0-1
COMMENTS LETTERS RECEIVED ON THE NOTICE OF PREPARATION

Individual	Agency/Affiliation	Date
Bruce Ohlson	Pittsburg Planning Commission	December 7, 2010
Louis Parsons	Discovery Builders Inc.	December 14, 2010
Camille Guiriba	Transform	January 4, 2011

Individual	Agency/Affiliation	Date
Jonathan Mendoza	Resident of Pittsburg	January 5, 2011
Jamar Stamps	Department of Conservation & Development, Transportation Planning Section	January 6, 2011
Lisa Carboni	California Department of Transportation (Caltrans)	January 7, 2011

Table 1.0-2 summarizes the major concerns identified for the project in these letters and at the December 14, 2010, Scoping Meeting.

TABLE 1.0-2
SUMMARY OF COMMENTS RECEIVED

Topic Area	Comments
General	• Request to include consideration of the preliminary site plan for the West Coast Home Builders property in the consideration of environmental effects in the DEIR. • All phases of the project should be analyzed.
Aesthetics	• Analysis should include impacts to views from properties to the south. • Analysis should include consideration of building heights, as they affect views.
Air Quality	• Current Bay Area Air Quality Management District screening tables for development adjacent to freeways should not be weighed too heavily in the analysis, as these tables are "in flux" and not yet in effect, as well as have the potential for false results.
Biological Resources	• Local policies should be considered. • The proposed project's consistency with the Habitat Conservation Plan should be considered.
Geology and Soils	• All potential impacts should be considered potentially significant and analyzed in the EIR due to the lack of a soil study or other technical analysis.
Greenhouse Gas Emissions	• Greenhouse gases should be analyzed in the EIR.
Hydrology and Water Quality	• Analysis should address drainage, including off-site impacts, and the on-site water detention basin. • All impervious areas, not only roadways, should be included in the drainage analysis. • Detention basin design should be "attractive." • EIR should consider regulatory requirements of the CCWD Code of Regulations on treated and untreated water service. • The EIR should consider impacts to the Contra Costa Canal, located across State Route (SR) 4 from the project.
Land Use	• The Master Plan should include increased densities and mixed-use designations. • Impacts of high density on surrounding neighborhoods should be considered.
Public Services/Utilities	• Impacts on local schools should be considered.

Topic Area	Comments
Recreational Resources	• Impacts on local recreation should be considered in the EIR, regardless of the Initial Study finding of no potentially significant impacts.
Transportation/Circulation	• Is there a need for four entrances to the Master Plan area? • Connectivity and integration between existing and future neighborhoods should be encouraged. • Project should incorporate a traditional street-grid pattern in both halves of the project area. • Circulation network should be aligned with existing roadways exiting existing development to the south. • Analysis of traffic and transportation impacts should not only focus on level of service, but also non-vehicle trips. • Trip generation should consider the mixed-use nature of the site. • Density and transit frequency should be considered in the EIR. • Offset between D Street and Oak Hills Drive could result in traffic conflicts. • Because SR 4, Bailey Road, and West Leland Road are designated Routes of Regional Significance in the East County Action Plan (Department of Conservation), the EIR should apply the transportation authority's travel demand model and technical procedures. • The section of Bailey Road south of the Pittsburg city limit should be included in the analysis. • The EIR should evaluate the worst-case traffic scenario. • The EIR should evaluate the adequacy of the project's pedestrian and bicycle connection to the East Bay Park Delta de Anza Regional Trail. • EIR analysis should include the Pittsburg/Bay Point BART Station Area Specific Plan, Bailey Road Bicycle and Pedestrian Improvement Plan, and Bay Point Community-Based Transportation Plan. • Transportation impacts and mitigation measures should consider temporary impacts/mitigation during each phase of development. • Impacts to station usage from the planned eBART project and its effects on the proposed Master Plan should be considered. • Ultimate traffic analysis should include increased truck traffic from the Keller Canyon Landfill expansion. • Analysis of the Bailey Road and SR 4 interchange should consider both the existing condition and the ultimate condition of the ramps/intersections in the Bailey Road Bicycle and Pedestrian Improvement Plan. • The project's fair share contribution, financing, scheduling, implementation responsibilities, and lead agency monitoring should be included in project mitigation. • Required roadway improvements should be completed prior to the issuance of a certificate of occupancy. • Project should include Transportation Demand Management measures. • The Traffic Impact Study should be completed according to Caltrans requirements. • The EIR should address the need for an encroachment permit for any work within the State Highway Right-of-Way. • Consider implementation of pedestrian/bicycle improvements as mitigation for increased vehicular traffic. • Use a traffic model that accounts for trip reductions from higher density, transit frequency, and other factors.

Topic Area	Comments
Cumulative Impacts	• Alves Ranch and County projects should be considered in the cumulative analysis. • Analysis should consider the Concord Naval Weapons Station Reuse Plan. • Air quality impacts of the eBART project should be considered.

DEIR

This document constitutes the Draft EIR (DEIR). The DEIR contains a description of the project, description of the environmental setting, identification of project impacts, and mitigation measures for impacts found to be significant, as well as an analysis of project alternatives. Upon completion of the DEIR, the City will file a Notice of Completion (NOC) with the State Office of Planning and Research, State Clearinghouse in order to begin the public review period.

PUBLIC NOTICE/PUBLIC REVIEW

Concurrent with the NOC, the City will provide public notice of the availability of the DEIR for public review and invite comment from the general public, agencies, organizations, and other interested parties. As a Master Plan for development and integration of a regional transportation network station (BART) and given the large number of units and square footage of retail and commercial expected to be constructed, the proposed project qualifies as a Project of Statewide, Regional, or Areawide Significance, requiring a minimum comment period of 45 days and submittal of the DEIR for state agency review to the State Clearinghouse (CEQA Section 21083(d); State CEQA Guidelines Section 15206). The review period in this case is expected to be 45 days. Public comment on the DEIR will be accepted both in written form and orally at public hearings. All comments or questions regarding the DEIR should be addressed to:

Leigha Schmidt, Project Planner
City of Pittsburg, Planning Division
65 Civic Avenue
Pittsburg, CA 94565

All public comments on the Draft EIR **must** be received at the City no later than **5:00 PM on August 1, 2011**

RESPONSE TO COMMENTS/FEIR

Following the DEIR public review period, a Final EIR (FEIR) will be prepared. The FEIR will respond to written comments received during the public review period.

CERTIFICATION OF THE EIR/PROJECT CONSIDERATION

The City Council will review and consider the FEIR. If the Council finds that the FEIR is "adequate and complete," the Council may certify the FEIR at a public hearing. The rule of adequacy generally holds that the EIR can be certified if it shows a good faith effort at full disclosure of environmental information and provides sufficient analysis to allow decisions to be made regarding the project in contemplation of its environmental consequences.

Upon review and consideration of the FEIR, the City may take action to approve, revise, or reject the project. A decision to approve the project would be accompanied by written findings in accordance with State CEQA Guidelines Section 15091 and, if applicable, Section 15093. A Mitigation Monitoring and Reporting Program (MMRP), as described below, would also be adopted for mitigation measures that have been incorporated into or imposed upon the project to reduce or avoid significant effects on the environment. The MMRP would be designed to ensure that these measures are carried out during project implementation.

MITIGATION MONITORING

CEQA Section 21081.6(a) requires lead agencies to adopt an MMRP to describe measures which have been adopted or made a condition of project approval in order to mitigate or avoid significant effects on the environment. The specific "reporting or monitoring" program required by CEQA is not required to be included in the EIR; however, it will be presented to the City Council for adoption. Throughout the DEIR, however, mitigation measures have been clearly identified and presented in language that will facilitate establishment of an MMRP. Any mitigation measures adopted by the City as conditions for approval of the project will be included in an MMRP to verify compliance. The MMRP will be included in checklist form in an appendix of the Master Plan to ensure implementation by future developers of the Master Plan.

1.7 TERMS AND ABBREVIATIONS

A complete list of CEQA and Project terms as well as abbreviations is included in **Appendix A** of this document).

2.0 Executive Summary

This section provides an overview of the project and the environmental analysis. For additional detail regarding specific issues, please consult the appropriate chapter of Sections 4.1 through 4.13 of this Draft Environmental Impact Report (DEIR).

2.1 PURPOSE AND SCOPE OF THE EIR

This DEIR provides an analysis of the potential environmental effects associated with the approval of the proposed Pittsburg/Bay Point BART Master Plan project located in the City of Pittsburg. For a complete description of the Master Plan, see Section 3.0, Project Description, of this DEIR.

The DEIR analysis focuses on potential impacts arising from development of the proposed project. The DEIR adopts this approach in order to provide a credible worst-case scenario of the impacts resulting from project implementation. Where appropriate, some impacts are analyzed under future conditions, which assume buildout of reasonably foreseeable projects in the area as appropriate under cumulative analysis conditions. All project-specific impacts are measured against the conditions that existed at the time of the release of the Notice of Preparation (December 2010).

2.2 PROJECT CHARACTERISTICS

The proposed project consists of a Master Plan outlining land use and design requirements within a 50.6-acre portion of the City of Pittsburg in the vicinity of the Pittsburg/Bay Point BART Station—the current eastern terminus of Bay Area Rapid Transit (BART) in Pittsburg. Approximately half of the Master Plan area is currently owned by BART, and the remaining half is owned by West Coast Home Builders (WCHB). The Master Plan would be expected to result in development of medium- and high-density multi-family residential uses as well as a number of retail uses, two new parking garages, a transit plaza and bus shelter adjacent to the BART station, and a number of "flex" uses which can be any mix of retail, commercial, or quasi-public uses, depending on market conditions at the time of development. Overall, the Master Plan is expected to result in the addition of 1,168 dwelling units and 146,362 square feet of nonresidential uses employing approximately 1,300 people. For more information on how the assumptions used by this DEIR were formulated, see Section 4.0.

The Master Plan includes specific design guidelines for structures, roadways, and an interconnected network of pedestrian/bicycle paths and facilities. Also included is a 0.4-acre park, an expanded stormwater detention basin, numerous landscape corridors along roads, and private recreation/open space. Section 3.0, Project Description, includes a full description of all features, and Section 4.0, Assumptions, provides the assumptions for future development characteristics used to determine the buildout of the Master Plan.

2.3 PROJECT ALTERNATIVES SUMMARY

California Environmental Quality Act (CEQA) Guidelines Section 15126.6 requires that an environmental impact report describe a range of reasonable alternatives to the project that could feasibly attain the basic objectives of the project and reduce the degree of environmental impact. Section 6.0, Alternatives to the Project, provides a qualitative analysis of alternatives as compared to the proposed project. Alternatives identified for the proposed project include the following:

- Under Alternative 1, the No Project, No Build Alternative scenario, the proposed project site is assumed to remain in its current condition as undeveloped land and surface parking for the BART station.

- Under Alternative 2, the West Coast Home Builders (WCHB) site would be constructed as proposed, but the BART properties would remain in their current state.

- Under Alternative 3, the proposed Master Plan would be constructed but building heights would be limited to three stories, except for the parking garages which would remain at their proposed height of five and six stories.

The City of Pittsburg was identified as the lead agency for the proposed project. In accordance with Section 15082 of the CEQA Guidelines, the City prepared and distributed a Notice of Preparation (NOP) of an EIR on December 7, 2010 (SCH# 2010122023). This notice was circulated to the public, local, state, and federal agencies, and other interested parties to solicit comments on the proposed project. The NOP is presented in **Appendix B** in this DEIR. In addition, an Initial Study was prepared for the project and released for public review at the same time as the NOP. The Initial Study is also included in **Appendix B**. On June 17, 2011 a Notice of Completion was filed with the State Clearinghouse for the Draft Environmental Impact Report (DEIR), concurrently kicking off a 45-day public review period of the DEIR document and associated technical appendices. The public review period on the DEIR ends on August 1, 2011, after which time all comments received will be responded to in writing and incorporated into a Final Environmental Impact Report (FEIR) for consideration by the City of Pittsburg City Council.

2.4 AREAS OF CONTROVERSY AND ISSUES TO BE RESOLVED

Table 1.0-2 lists comments received during the NOP and Initial Study phases of environmental review, all of which represent potential areas of controversy. Additional comments were received that did not concern the adequacy or scope of the environmental analysis under CEQA, including:

- Adequate parking supply for the BART station;

- The merits of mixed-use development over traditional suburban uses; and

- Various proposed alternative land use arrangements.

Concerns raised in response to the NOP were considered during the preparation of the DEIR. Comment letters, and a summary of comments received at the December 14, 2010 Scoping Meeting, are presented in **Appendix B** of this EIR.

2.5 SUMMARY OF ENVIRONMENTAL IMPACTS

Table 2.0-1 presents a summary of project impacts found by this analysis to be less than significant. **Table 2.0-2** lists all impacts found to be significant but for which the application of mitigation was found to reduce the overall impact to less than significant. **Table 2.0-3** lists all impacts found to be significant and unavoidable, even where mitigation was included. For detailed discussions of all project impacts and mitigation measures, the reader is referred to the technical environmental analysis in Section 4.0, Assumptions, and the following technical analysis sections (Sections 4.1 through 4.13).

TABLE 2.0-1
PROJECT IMPACTS NOT REQUIRING MITIGATION

Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
4.1 Land Use			
Impact 4.1.1 The proposed Master Plan is consistent with Pittsburg General Plan policies and the requirements of the Zoning Code. This impact is considered **less than significant.**	LS	None required.	LS
Impact 4.1.2 Implementation of the proposed project, in combination with existing, approved, proposed, and reasonably foreseeable development, would result in development that would change existing land uses patterns and intensity. As this change was anticipated in the General Plan, this impact is considered **less than cumulatively considerable.**	LCC	None required.	LCC
4.2 Population and Housing			
Impact 4.2.1 The proposed Master Plan would allow for the construction of additional housing in the Master Plan area as well as retail, commercial, and quasi-public uses that will generate additional employees in the city. This growth was anticipated by the General Plan, thus the impact would be **less than significant**.	LS	None required.	LS
Impact 4.2.2 Development of the proposed project, in combination with other approved, planned, or potential future projects, would contribute to additional population residing and working in the vicinity through the addition of new employment opportunities and residential units. This is a **less than cumulatively considerable** impact.	LCC	None required.	LCC
4.3 Hazards			
Impact 4.3.1 Implementation of the proposed Master Plan would result in additional residences and commercial development in the Master Plan area anticipated by local emergency planning. Furthermore, internal features of the Master Plan would not interfere with emergency response actions through traffic impacts and roadway designs. This is considered a **less than significant** impact.	LS	None required.	LS
Impact 4.3.2 The proposed Master Plan is surrounded by existing and approved development. This, coupled with required implementation of existing fire safety regulations, will ensure that the proposed Master Plan has a **less than significant** impact.	LS	None required.	LS

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LS – Less Than Significant *S - Significant* *CC – Cumulatively Considerable*

Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
Impact 4.3.3 The proposed Master Plan would introduce development within 3 miles of identified hazards materials release and cleanup efforts. However, these sites do not represent a threat to the Master Plan Area and this would have a **less than significant** impact.	LS	None required.	LS
Impact 4.3.4 Implementation of the proposed project, in addition to existing, approved, proposed, and reasonably foreseeable development in the area, would contribute to an increase in potential conflicts with emergency response plans and wildland fire hazards. Considering site-specific conditions, this is considered a **less than cumulatively considerable** impact.	LCC	None required.	LCC
4.4 Transportation and Traffic			
Impact 4.4.1 Development of the proposed Master Plan would not exceed a level of service standard established by the City of Pittsburg, CCTA, or Caltrans for some designated roads or highways. This impact is considered **less than significant.**	LS	None required.	LS
Impact 4.4.3 Development of the proposed Master Plan would include an internal roadway network ensuring adequate emergency access, and all internal roadways would operate at acceptable levels. This impact is considered **less than significant**.	LS	None required.	LS
4.5 Noise			
Impact 4.5.2 Implementation of the proposed project would not result in a significant increase in traffic noise levels at nearby noise-sensitive receptors. This impact would be considered **less than significant**.	LS	None required.	LS
Impact 4.5.6 Implementation of the proposed project would not result in a substantial contribution to cumulative noise levels. The impact would be considered **less than cumulatively considerable.**	LCC	None required.	LCC
4.6 Air Quality			
Impact 4.6.2 Subsequent land use activities associated with implementation of the proposed Master Plan would result in increased population and vehicle miles traveled over current conditions. As Clean Air Plan Control Strategies would be applied to the proposed Master Plan via requirements of the General Plan, this impact is considered to be **less than significant.**	LS	None required.	LS

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LS – Less Than Significant ***S - Significant*** ***CC – Cumulatively Considerable***

Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
Impact 4.6.4 Implementation of the proposed Master Plan would not result in increased population and employment that would result in level of service operations that would be inconsistent with the region's congestion management program. This is considered to be a **less than significant** impact.	LS	None required.	LS
Impact 4.6.6 Subsequent land use activities associated with implementation of the proposed Master Plan would not create objectionable odors affecting a substantial number of people or expose new residents to existing sources of odor. Thus, this impact is considered to be **less than significant**.	LS	None required.	LS
4.7 Geology and Soils			
Impact 4.7.1 The Master Plan area does not contain any known fault lines, nor does it encompass any Alquist-Priolo Fault Zones. Therefore, the impacts of ground rupture on the project site are considered **less than significant.**	LS	None required.	LS
Impact 4.7.2 The Master Plan area is located on flatland soils in an area of the City of Pittsburg not identified as having a high liquefaction potential. This impact is considered **less than significant**.	LS	None required.	LS
Impact 4.7.5 Development described by the proposed Master Plan in addition to other proposed and approved project in the vicinity would not result in creation or exacerbation of any identified geological or soils impacts. This impact is considered **less than cumulatively considerable.**	LCC	None required.	LCC
4.8 Hydrology and Water Quality			
Impact 4.8.1 Construction following implementation of the proposed Master Plan would not result in discharge of pollutants and soils during construction, nor increased surface runoff and release of contaminants during operation. Therefore, impacts associated with violation of water quality standards or discharge requirements are considered **less than significant.**	LS	None required.	LS
Impact 4.8.2 The proposed Master Plan includes a detention basin, which would allow recharge of groundwater. Water supply for the City of Pittsburg is made up primarily of surface water. Therefore, impacts to groundwater supplies and recharge are considered **less than significant**.	LS	None required.	LS

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Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
Impact 4.8.3 Development associated with the Master Plan would increase local runoff on the project site but would not lead to flows that could exceed the capacities of existing storm sewer facilities. This impact is considered **less than significant.**	LS	None required.	LS
Impact 4.8.4 The proposed project, in combination with existing, approved, proposed, and reasonably foreseeable development, would not contribute to the cumulative effects of degradation of regional water quality, changes to runoff patterns, or the potential for increased flooding. This would be a **less than cumulatively considerable** impact.	LCC	None required.	LCC
4.9 Biological Resources			
Impact 4.9.3 Implementation of the proposed project would not result in off-site disturbance, degradation, and/or removal of sensitive biological communities. This would be a **less than significant** impact.	LS	None required, however implementation of mitigation measure **MM 4.9.1** would help ensure the impact is LS.	LS
Impact 4.9.5 Implementation of the proposed project would not interfere with the movement of special-status and common wildlife species. There is **no impact**.	N	None required.	N
4.10 Aesthetics			
Impact 4.10.1 The proposed project would redevelop the existing developed portions of the site and place a combination of residential and retail uses on the portion of the site which is currently vacant. This would result in an alteration of views of the site and the vicinity. Such impacts are considered **less than significant**.	LS	None required.	LS
Impact 4.10.4 The proposed project would redevelop the existing developed portions of the site and place a combination of residential and retail uses on the portion of the site which is currently vacant. This development would expand on current urban uses in the area and create new sources of nighttime light. Existing Pittsburg Municipal Code requirements would ensure this impact is **less than significant**.	LS	None required.	LS
Impact 4.10.5 Development in the Master Plan area, together with reasonably foreseeable development in areas immediately adjacent to the Master Plan area, may have a cumulative impact on visual quality. This impact is considered **less than cumulatively considerable.**	LCC	None required.	LCC

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Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
4.11 Public Services and Utilities			
Impact 4.11.1.1 The proposed Master Plan could increase the need for fire protection and emergency response during the operational phase. However, the increased demand would not result in the expansion or construction of facilities that could result in a physical effect, resulting in a **less than significant** impact.	LS	None required.	LS
Impact 4.11.1.2 Implementation of the proposed Master Plan, in combination with other reasonably foreseeable development, would increase the number of accidents, calls, and responses within the CCCFPD service area and require additional fire services. However, this impact would be **less than cumulatively considerable**.	LCC	None required.	LCC
Impact 4.11.2.1 The proposed Master Plan could increase the need for police services; however, the increased demand would not result in the expansion or construction of facilities that could result in a physical effect. This would be a **less than significant** impact.	LS	None required.	LS
Impact 4.11.2.2 The proposed Master Plan, in addition to proposed and reasonably foreseeable development, would increase the demands on the City of Pittsburg Police Department and BART Police, and require additional law enforcement services under cumulative conditions. This would be a **less than cumulatively considerable** impact.	LCC	None required.	LCC
Impact 4.11.3.1 Proposed land uses in the Master Plan would result in generation of 408 new students to be enrolled in the Mount Diablo Unified School District. This impact is considered **less than significant**.	LS	None required.	LS
Impact 4.11.3.2 Implementation of the proposed Master Plan, as well as potential development within the cumulative setting area, would result in cumulative public school impacts. These cumulative public school impacts are considered **less than cumulatively considerable**.	LCC	None required.	LCC
Impact 4.11.4.1 The proposed Master Plan would require water service for the development expected in the Master Plan area. This water would be sourced from existing ground and surface sources, representing a **less than significant** impact.	LS	None required.	LS
Impact 4.11.4.2 The proposed Master Plan would be expected to result in development of new residential and commercial uses in the City of Pittsburg water service area, which would require provision of additional water. As this growth was anticipated by the City and was found adequate by a Water Supply Assessment, this impact would be **less than significant**.	LS	None required.	LS

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Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
Impact 4.11.4.3 Implementation of the proposed Master Plan, in combination with cumulative development in the City of Pittsburg, would increase the current demand for CCWD water supply. This increase in demand was anticipated by both CCWD and the City of Pittsburg, resulting in a **less than cumulatively considerable** impact.	LCC	None required.	LCC
Impact 4.11.5.1 Expected new development as a result of the Master Plan would not exceed current wastewater collection and treatment capacity. As Delta Diablo Sanitation District facilities would adequately accommodate the projected growth upon implementation of a recently approved treatment plant expansion project, this impact is **less than significant**.	LS	None required.	LS
Impact 4.11.5.2 Implementation of the proposed Master Plan, in combination with foreseeable development in the area, would not result in a cumulative demand for wastewater treatment capacity that could require additional wastewater facilities. This would be a **less than cumulatively considerable** impact.	LCC	None required.	LCC
Impact 4.11.6.1 Proposed Master Plan development could impact solid waste collection services and landfill capacity. This impact is considered **less than significant**.	LS	None required.	LS
Impact 4.11.6.2 The proposed project would contribute to cumulative demands for solid waste disposal services. This would be a **less than cumulatively considerable** contribution to the cumulative impact.	LCC	None required.	LCC
Impact 4.11.7.1 Implementation of the proposed Master Plan would require additional electric and natural gas supplies, along with conveyance facilities for these and telephone and cable television services. This impact is considered **less than significant**.	LS	None required.	LS
Impact 4.11.7.2 Implementation of the proposed Master Plan would cause an increase in energy use. However, the proposed project is not designed to use energy in a wasteful manner. This impact is therefore considered **less than significant**.	LS	None required.	LS
Impact 4.11.7.3 Implementation of the proposed Master Plan, as well as potential development in the surrounding areas, would result in an increase in cumulative utility service demands. The proposed Master Plan would have a **less than cumulatively considerable** impact on electrical, natural gas, telephone, and cable television services.	LCC	None required.	LCC

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Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
Impact 4.12.1 Implementation of the proposed Master Plan would result in population growth in the city over the next 20 years, which would not result in over-capacity issues at existing recreational facilities nor would it encourage the construction of additional recreational facilities outside the Master Plan Area. This impact is considered **less than significant**.	LS	None required.	LS
Impact 4.12.2 Implementation of the proposed Master Plan, in conjunction with other future development, would not require additional park and recreation facilities within the boundaries of the city. This impact would be **less than cumulatively considerable**.	LCC	None required.	LCC
Impact 4.13.1 Implementation of the proposed Master Plan would result in a net increase in greenhouse gas emissions that would not conflict with the goals of AB 32 or result in a significant impact on the environment. This impact is **less than cumulatively considerable.**	LCC	None required.	LCC

TABLE 2.0-2
PROJECT IMPACTS WHERE SIGNIFICANCE CAN BE REDUCED THROUGH MITIGATION

Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
4.4 Transportation and Traffic			
Impact 4.4.2 Development of the proposed Master Plan could substantially increase hazards during the construction period due to the increased truck traffic, restricted circulation within the existing BART parking lot during the construction, and potential parking shortages if existing parking areas are used for construction staging and alternative parking supplies are not provided. This impact is considered **potentially significant.**	PS	**MM 4.4.2** Future developers shall develop a construction management plan for review and approval by the City of Pittsburg Engineering Division. The plan shall include at least the following items: • Development of a construction truck route that would appear on all construction plans to limit truck and auto traffic on nearby residential streets. • Comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak hour traffic hours and peak activity of the BART station, detour signs if required, lane closure procedures, sidewalk closure procedures, cones for drivers, and designated	LS

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Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
		construction access routes. • Identification of alternative parking supplies for existing BART patrons and construction workers when existing parking facilities are unavailable. • Notification procedures for adjacent property owners and public safety personnel regarding when major deliveries, detours, and lane closures would occur. • Location of construction staging areas for materials, equipment, and vehicles. • Identification of haul routes for movement of construction vehicles that would minimize impacts on vehicular and pedestrian traffic, circulation and safety, and provision for monitoring surface streets used for haul routes so that any damage and debris attributable to the haul trucks can be identified and corrected by the developer. • A process for responding to, and tracking, complaints pertaining to construction activity, including identification of an on-site complaint manager. *Timing/Implementation: Mitigation to occur prior to and during construction. Plan shall be submitted prior to issuance of grading permit.* *Enforcement/Monitoring: City of Pittsburg Engineering Division.*	
Impact 4.4.4 Development of the proposed Master Plan would conflict with some adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, transit load factors, bicycle racks, pedestrian amenities), namely those related to bicycle circulation. This impact is considered **potentially significant**.	PS	**MM 4.4.4** The City of Pittsburg shall complete the planned bicycle network along Bailey Road from West Leland to Willow Pass Road, along West Leland to San Marco Boulevard and along San Marco Boulevard from Rio Verde Circle to West Leland Road prior to issuance of certificates of occupancy. *Timing/Implementation: Payment of future development projects' fair share shall be made prior to issuance of any building permits.* *Enforcement/Monitoring: City of Pittsburg Engineering Division*	LS

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Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
Impact 4.4.5 The proposed Master Plan may cause an increase in traffic that is substantial in relation to the cumulative traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or reduction in level of service) during the cumulative plus project condition. This impact is **cumulatively considerable**.	CC	**MM 4.4.5b** Future development projects in the Master Plan Area shall contribute their fair share to implement improvements that would improve intersection operations at the San Marco Boulevard/West Leland Road intersection, including: • Westbound: Modify north leg of intersection to provide a third receiving lane to permit free westbound right-turn movement. • Northbound: Modify to provide one left-turn lane, two through lanes, and a right-turn only lane. These improvements may require traffic signal modifications. *Timing/Implementation: Payment of future development projects' fair share shall be made prior to issuance of any building permits.* *Enforcement/Monitoring: City of Pittsburg Development Services Department.*	LCC
		MM 4.4.5e Future development projects in the Master Plan Area shall contribute their fair share to implement the following improvements that would improve operations at Bailey Road/West Leland Road intersection: • Restripe the northbound approach to provide dual left-turn lanes. • Widen the eastbound approach to add a second left-turn lanes and one right-turn lane These improvements are consistent with the City of Pittsburg's Five Year Capital Improvement Program 2011-2012 through 2016-2017). These improvements may require traffic signal modifications. *Timing/Implementation: Payment of future development projects' fair share shall be made prior to issuance of any building permits.* *Enforcement/Monitoring: City of Pittsburg Development Services Department*	LCC
		MM 4.4.5c As part of development of the BART parcels, the City of Pittsburg shall ensure that construction of the northbound approach of the West Leland Road/Oak Hills Drive/D Street intersection provides a left-turn and a through-right shared lane and modification of the traffic signal to provide	SC/LS

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Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
		protected north-south left-turn movements. *Timing/Implementation: Payment of future development projects' fair share shall be made prior to issuance of building permits on BART - owned properties.* *Enforcement/Monitoring: City of Pittsburg Development Services Department in consultation with BART.* Implementation of mitigation measure **MM4.4.5c** would provide additional turning movement capacity. However, the intersection would continue to operate deficiently. Therefore, this impact will remain **significant and unavoidable** even with implementation of mitigation. Were mitigation measure **MM 4.4.5c** implemented, all disturbance would occur within the existing intersection right-of-way and would not increase the pedestrian crossing time. Therefore the secondary impact of implementing this mitigation to other modes of travel would be **less than significant**.	
		MM 4.4.5d The City of Pittsburg shall cooperate with Contra Costa County to develop a program to fund and implement improvements that would result in acceptable intersection operations at the Bailey Road/Willow Pass Road intersection. Future development projects in the Master Plan Area shall contribute their fair share to these improvements which include conversion of the center through lane to a shared left-through lane. *Timing/Implementation: Payment of future development projects' fair share shall be made prior to issuance of building permits or in accordance with any future agreements between the County and the City.* *Enforcement/Monitoring: Contra Costa County Public Works Department and City of Pittsburg Development Services Department* Implementation of mitigation measure **MM 4.4.5d** would provide additional turning movement capacity and result in acceptable intersection operations. Since this intersection is under the jurisdiction of Contra Costa County, neither the City nor a future applicant for development has control over approval or timing of such an improvement. Therefore, the impact is considered **significant and unavoidable** because it is outside the jurisdiction of the City of Pittsburg. Mitigation measures **MM 4.4.5d** could be implemented within the existing	SU/LS

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Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
		intersection right-of-way and would not increase the pedestrian crossing time. Therefore the secondary impact of implementing this mitigation to other modes of travel would be less than significant. **MM 4.4.5e** could not be implemented within the existing intersection right-of-way. Additional right-of-way would be needed to widen the eastbound approach at the intersection. In addition, widening the eastbound approach would increase the pedestrian crossing time, resulting in secondary impacts on pedestrians.	
4.5 Noise			
Impact 4.5.1 Short-term construction activities could result in a substantial temporary increase in ambient noise levels at nearby noise-sensitive land uses, which may result in increased levels of annoyance, activity interference, and sleep disruption. This impact is considered **potentially significant**	PS	**MM 4.5.1** All future development in the Master Plan Area shall conform to the following noise requirements: a. Construction activities (excluding activities that would result in a safety concern to the public or construction workers) shall be limited to between the hours of 8:00 AM and 5:00 PM on weekdays, or as approved by the City Engineer. Construction activities shall be prohibited on federal holidays. b. Construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and shrouds, in accordance with manufacturers' recommendations. In the absence of manufacturers' recommendations, the Director of Public Works may prescribe such means of achieving maximum noise attenuation. c. Construction equipment staging areas shall be located at the furthest distance possible from nearby noise-sensitive land uses. d. All motorized construction equipment and vehicles shall be turned off when not in use. *Timing/Implementation: Prior to and during construction* *Enforcement/Monitoring: City of Pittsburg Development Services Department*	LS

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Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
Impact 4.5.3 Implementation of the proposed project may result in non-transportation noise levels that could exceed applicable noise thresholds at nearby proposed land uses. This impact would be considered **potentially significant**.	PS	**MM 4.5.3a** Prior to construction of any parking garages, BART or their assigned agent or developer shall undertake one of the two options: a. Provide increased noise shielding for planned adjacent residential land uses. The proposed multi-story parking garages shall be designed and constructed so that the façades of the parking structure facing nearby noise-sensitive land uses are of solid construction, sufficient to shield line-of-sight between interior parking areas and outdoor activity areas of the adjacent planned residential land uses. To effectively reduce sound transmission, the material chosen must be rigid and sufficiently dense (at least 4 lbs/square foot [20 kilograms/square meter]). Furthermore, planned residential land uses located within 75 feet of the bus transit center and proposed parking garages shall be designed and constructed so that exterior activity areas (e.g., courtyards, patios, private areas) are shielded from direct line-of-sight of the bus transit center and proposed parking garages. -OR- b. An acoustical analysis shall be prepared for each of the proposed parking structures once more detailed design-related information for the proposed parking structure and/or adjacent planned residential land uses becomes available. The acoustical analysis shall identify noise control devices (e.g., barriers, acoustical vents and screens), to ensure that predicted noise levels at the adjacent planned residential land uses would not exceed acceptable levels. *Timing/Implementation: Prior to approval or issuance of any grading or construction permits for the parking garages* *Enforcement/Monitoring: City of Pittsburg Development Services Department* **MM 4.5.3b** All loading and unloading activities for proposed on-site commercial and retail land uses, including waste collection activities, shall be limited to between the hours of 7:00 AM and 10:00 PM. Timing/Implementation: As a Condition of Approval for any building or development permits Enforcement/Monitoring: City of Pittsburg Development Services	LS

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Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
		Department **MM 4.5.3c** All proposed residential land uses shall comply with California Code of Regulations Title 24 noise standards for allowable interior noise levels (California Building Code, 1998 edition, Volume 1, Appendix Chapter 12, Section 1208A). An acoustical study shall be prepared by a qualified professional demonstrating compliance with applicable interior noise standard of 45 dBA CNEL in habitable rooms. *Timing/Implementation: As a Condition of Approval for any building or development permits.* *Enforcement/Monitoring: City of Pittsburg Development Services Department* **MM 4.5.3d** All proposed commercial, retail, flex, and residential land uses shall be equipped with fresh air supply systems or air conditioning systems to allow windows to remain closed during inclement weather conditions. *Timing/Implementation: As a Condition of Approval for any building or development permits.* *Enforcement/Monitoring: City of Pittsburg Development Services Department*	
Impact 4.5.4 Projected on-site noise levels at proposed on-site land uses would exceed the City's normally acceptable noise exposure standards for land use compatibility. As a result, this impact is considered **potentially significant**.	PS	Implementation of **MM 4.5.3a** through **MM 4.5.3d**.	LS

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Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
4.6 Air Quality			
Impact 4.6.1 Subsequent land use activities associated with implementation of the proposed Master Plan could result in short-term construction emissions that could violate or substantially contribute to violations of federal and state ambient air quality standards. This impact is considered to be **potentially significant.**	PS	**MM 4.6.1** All future development in the Master Plan area shall implement BAAQMD-approved criteria air pollutant-reducing Basic Construction Mitigation Measures to the maximum extent feasible, whether or not construction-related emissions exceed applicable thresholds of significance. The developer shall use the best management practices that are in place at the time of development. Current best management practices shall include the following: 1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day. 2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered. 3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. 4. All vehicle speeds on unpaved roads shall be limited to 15 mph. 5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used. 6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points. 7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. 8. All project developers shall post a publicly visible sign with the telephone number and person to contact at the City of Pittsburg regarding dust complaints during any construction activities. This person shall respond and take corrective action within 48 hours. The Air District's phone	LS

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Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
		number shall also be visible to ensure compliance with applicable regulations (BAAQMD 2010). The above measures or any additional or modified measures listed by the Bay Area Air Quality Management District at the time of construction shall be implemented to the degree mandated by the discretion of the City at the time of issuance of any development permits. *Timing/Implementation: As a Condition of Approval for all development permits.* *Enforcement/Monitoring: City of Pittsburg Development Services Department*	
Impact 4.6.5 Subsequent land use activities associated with implementation of the proposed Master Plan could result in sources of toxic air contaminants that could affect surrounding land uses. Subsequent land use activities could also place sensitive land uses near existing sources of toxic air contaminants. These factors could result in the exposure of sensitive receptors to substantial concentrations of toxic air contaminants and/or fine particulate matter. This is considered a **potentially significant** impact.	PS	**MM 4.6.5a** Tiered plantings of trees such as redwood, deodar cedar, live oak, and oleander shall be installed between State Route 4 and the proposed Master Plan area in order to reduce TAC and PM exposure. *Timing/Implementation: As a Condition of Approval for any project within 500 feet of State Route 4* *Enforcement/Monitoring: City of Pittsburg Development Services Department* **MM 4.6.5b** As a part of future development proposals in the Master Plan Area, the project proponent(s) shall secure the services of a qualified air quality professional for the preparation of site-specific air quality modeling, as required by the Bay Area Air Quality Management District (BAAQMD). If site-specific modeling indicates that significant exposure to criteria pollutants, including toxic air contaminants, would occur, future development shall comply to the maximum extent feasible with mitigation measures provided by BAAQMD for the reduction of air quality impacts. These measures shall comply with the most current regulations available at the time of development and will likely include the following measures: • Modification to the location and height of intakes to the ventilation system; • Addition of HEPA air filtration systems; • Limiting the placement of recreational use areas, such as patio areas and balconies, to interior courtyards requiring that they be shielded by the	LS

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LS – Less Than Significant ***S - Significant*** ***CC – Cumulatively Considerable***

Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
		structure; • Triple-paned windows; • Central heating, ventilation, and air conditioning (HVAC) systems with high-efficiency filters, • Locating air intake systems for the HVAC systems as far away from the roadway as possible; and/or • An ongoing HVAC maintenance plan. These measures shall be designed and implemented to the satisfaction of the City in consultation with BAAQMD. Site-specific modeling shall be conducted for all development within the project area and shall use the most current standards and mitigation applicable at the time of the modeling are included. *Timing/Implementation: Prior to approval of any planning entitlements for development projects in the Master Plan Area.* *Enforcement/Monitoring: City of Pittsburg Development Services Department in consultation with the Bay Area Air Quality Management District.* **MM 4.6.5c** All construction within the Master Plan area shall implement measures to reduce the emissions of TAC pollutants generated by heavy-duty diesel-powered equipment during construction. a. Keep all construction equipment in proper tune in accordance with manufacturer's specifications. b. Use late model heavy-duty diesel-powered equipment during construction to the extent that it is readily available in the San Francisco Bay Area. c. Use diesel-powered equipment that has been retrofitted with after-treatment products (e.g., engine catalysts) to the extent that it is readily available in the San Francisco Bay Area. d. Use low-emission diesel fuel for all heavy-duty diesel-powered equipment operating and refueling at construction sites to the extent that it is readily available and cost effective in the San Francisco Bay Area (this does not apply to diesel-powered trucks traveling to and from the site). e. Utilize alternative fuel construction equipment (i.e., compressed natural	

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Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
		gas, liquid petroleum gas, and unleaded gasoline) to the extent that the equipment is readily available and cost effective in the San Francisco Bay Area. f. Limit truck and equipment idling time to five minutes or less. g. Rely on the electricity infrastructure surrounding the construction sites rather than electrical generators powered by internal combustion engines to the extent feasible. *Timing/Implementation: As a Condition of Approval for any grading or construction permit* *Enforcement/Monitoring: City of Pittsburg Development Services Department*	
4.7 Geology and Soils			
Impact 4.7.3 Portions of the Master Plan area are in areas identified as containing unstable soils, which could cause impacts to structures and uses constructed in the Master Plan area as a result of the Master Plan and could result in lateral spreading, subsidence, collapse, or other effects both on- and off-site. This is a **potentially significant** impact.	PS	**MM 4.7.3** Prior to approval of any building permits, grading permits, or other approval that would result in ground disturbance, a geotechnical analysis shall be prepared by a registered geologist or other professional approved by the City and presented to the City for approval. The required geotechnical analysis shall include consideration of all potential soil and seismic effects, including but not limited to liquefaction, soil stability, and soil shrink/swell potential and shall include recommended actions to reduce the effects of such conditions on the proposed construction. These recommendations shall be enacted to the satisfaction of the City in order to minimize these effects. Because subsurface and soil conditions change only very slowly (on the order of millennia), a geotechnical analysis shall be prepared and submitted to the Engineering Division for approval for all proposed development proposed under the Master Plan. *Timing/Implementation: Prior to approval of any grading permit, building permit, or other approval that would result in ground disturbance* *Enforcement/Monitoring: City of Pittsburg Development Services Department*	LS

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LS – Less Than Significant *S - Significant* *CC – Cumulatively Considerable*

Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
Impact 4.7.4 The proposed project is located on some clay soils, which may have the potential for expansion and contraction. Impacts associated with expansive soils are considered **potentially significant.**	PS	Implement mitigation measure **MM 4.7.3**.	LS
4.9 Biological Resources			
Impact 4.9.1 Implementation of the proposed project could not result in direct or indirect loss of habitat and individuals of endangered, threatened, rare, proposed, or candidate status, including plant species identified by the California Native Plant Society with a rating of List 1A or 1B (i.e., rare, threatened, or endangered plants). This would be a **potentially significant** impact.	PS	**MM 4.9.1** Prior to approval of any ground disturbing permits, project proponents within the Master Plan Area shall secure the services of a qualified biologist to prepare a Planning Survey Report (PSR) consistent with the requirements of the East Contra Costa County HCP/NCCP, along with any related supporting studies. For any special status species or habitat identified by the PSR, avoidance and minimization measures provided by the HCP/NCCP shall be implemented during both construction and operation of the project. Separate PSRs shall be prepared for each property within the Master Plan Area prior to the time of ground disturbance for that property in the Master Plan Area. *Timing/Implementation: Studies shall be prepared prior to approval of any ground disturbing permits (development, grading, etc.). Avoidance and minimization measures indicated by the PSR shall be made a Condition of Approval for those permits.* *Enforcement/Monitoring: City of Pittsburg Development Services Department in consultation with the East Contra Costa County HCP/NCCP.*	LS
Impact 4.9.2 Implementation of the proposed Master Plan could result in direct and indirect loss of habitat and individuals of animal and plant species of concern, listed as "fully protected" in the Fish and Game Code of California (Section 3511, 4700, 5050, 5515), migratory birds protected under the Migratory Bird Treaty Act, and other non-listed special-status species. This would be a **potentially**	PS	Implement mitigation measure **MM 4.9.1**.	LS

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LS – Less Than Significant ***S - Significant*** ***CC – Cumulatively Considerable***

Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
significant impact.			
Impact 4.9.4 The project would modify the on-site detention basin which may qualify as a federally protected wetland as defined by Section 404 of the Clean Water Act (including, but not limited to, riverine, marsh, seasonal wetland, etc.) through direct removal, filling, hydrological interruption, or other means. This is a **potentially significant** impact.	PS	**MM 4.9.4** Prior to any disturbance within 150 feet of the on-site detention basin, a qualified biologist shall make a determination as to the jurisdictional status of the detention basin, including but not limited to a verified wetland delineation and direct consultation with the U.S. Army Corps of Engineers (USACE). If the detention basin is determined to be a jurisdictional water or wetland, then all required permits shall be secured from USACE and all avoidance and minimization measures required by the U.S. Army Corps of Engineers shall be undertaken. *Timing/Implementation: Prior to approval of any grading permit or other ground disturbance within 150 feet of the on-site detention basin* *Enforcement/Monitoring: City of Pittsburg Development Services Department*	LS
Impact 4.9.6 Implementation of the proposed project could conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or any adopted biological resources recovery or conservation plan of any federal or state agency through direct and indirect impacts to special status species and their habitat. This would be a **potentially significant** impact.	PS	Implement mitigation measures **MM 4.9.1** and **MM 4.9.4**.	LS
Impact 4.9.7 Implementation of the project would result in the loss of coniferous and black cottonwood trees currently included in landscaping on developed portions of the Master Plan Area. These losses could conflict with the Pittsburg Municipal Code and the East Contra Costa County HCP/NCCP, resulting in a **potentially significant** impact.	PS	Implement mitigation measure **MM 4.9.1**.	LS

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Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
Impact 4.9.8 Implementation of the proposed project, in combination with existing, approved, proposed and reasonably foreseeable development, could result in the conversion of habitat and impact biological resources. This impact is considered **cumulatively considerable**.	CC	Implement mitigation measures **MM 4.9.1** and **MM 4.9.4**.	LCC
4.10 Aesthetics			
Impact 4.10.2 Development of the Master Plan would introduce development adjacent to the south side of SR 4, which would alter existing views of the southern hills to motorists traveling on the highway. This impact is considered **potentially significant**.	PS	**MM 4.10.2** Landscaping and building placement along the northern boundary of the project site shall consider viewpoints from State Route 4 to the north. To the maximum extent feasible, buildings throughout the site shall be broken up to allow for retention of viewsheds to the hills, and landscaping shall be staggered so that it does not block those views. Landscaping along the northern boundary of the Master Plan area shall be maintained and kept in good condition throughout the use of the property. *Timing/Implementation: As a Condition of Approval for any development permit for properties adjacent to the northern Master Plan boundary* *Enforcement/Monitoring: City of Pittsburg Development Services Department*	LS
Impact 4.10.3 Development of the Master Plan area would result in structures that could block existing views from adjacent properties of the hills south of the city and Suisun Bay to the north. This impact is considered **potentially significant.**	PS	Implementation of mitigation measure **MM 4.10.2.**	LS

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LS – Less Than Significant *S - Significant* *CC – Cumulatively Considerable*

TABLE 2.0-3
PROJECT IMPACTS FOUND TO BE SIGNIFICANT AND UNAVOIDABLE AND/OR CUMULATIVELY CONSIDERABLE

Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
4.1 Transportation and Traffic			
Impact 4.4.5 The proposed Master Plan may cause an increase in traffic that is substantial in relation to the cumulative traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or reduction in level of service) during the cumulative plus project condition. This impact is **cumulatively considerable**.	CC	**MM 4.4.5a** The City of Pittsburg shall cooperate with Caltrans to develop a program to fund and implement improvements that could include: • construction of additional turn lanes so as to improve operations at the San Marco Boulevard/SR 4 Eastbound Ramps intersection; • the conversion of the center eastbound left-turn lane to a left-right shared lane at the intersection of Willow Pass Road and Eastbound SR 4; Future development projects in the Master Plan Area shall contribute their fair share to these improvements, which include converting the second eastbound left-turn lane to a shared left/right turn lane. *Timing/Implementation: Payment of future development projects' fair share shall be made prior to approval of any building permits.* *Enforcement/Monitoring: Caltrans and City of Pittsburg Development Services Department*	SU
		MM 4.4.5c As part of development of the BART parcels, the City of Pittsburg shall ensure that construction of the northbound approach of the West Leland Road/Oak Hills Drive/D Street intersection provides a left-turn and a through-right shared lane and modification of the traffic signal to provide protected north-south left-turn movements. *Timing/Implementation: Payment of future development projects' fair share shall be made prior to issuance of building permits on BART - owned properties.* *Enforcement/Monitoring: City of Pittsburg Development Services Department in consultation with BART.* Implementation of mitigation measure **MM4.4.5c** would provide additional turning movement capacity. However, the intersection would continue to operate deficiently. Therefore, this impact will remain **significant and**	SC/LS

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LS – Less Than Significant ***S - Significant*** ***CC – Cumulatively Considerable***

Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
		unavoidable even with implementation of mitigation. Were mitigation measure **MM 4.4.5c** implemented, all disturbance would occur within the existing intersection right-of-way and would not increase the pedestrian crossing time. Therefore the secondary impact of implementing this mitigation to other modes of travel would be **less than significant**.	
		MM 4.4.5d The City of Pittsburg shall cooperate with Contra Costa County to develop a program to fund and implement improvements that would result in acceptable intersection operations at the Bailey Road/Willow Pass Road intersection. Future development projects in the Master Plan Area shall contribute their fair share to these improvements which include conversion of the center through lane to a shared left-through lane. *Timing/Implementation: Payment of future development projects' fair share shall be made prior to issuance of building permits or in accordance with any future agreements between the County and the City.* *Enforcement/Monitoring: Contra Costa County Public Works Department and City of Pittsburg Development Services Department* Implementation of mitigation measure **MM 4.4.5d** would provide additional turning movement capacity and result in acceptable intersection operations. Since this intersection is under the jurisdiction of Contra Costa County, neither the City nor a future applicant for development has control over approval or timing of such an improvement. Therefore, the impact is considered **significant and unavoidable** because it is outside the jurisdiction of the City of Pittsburg. Mitigation measures **MM 4.4.5d** could be implemented within the existing intersection right-of-way and would not increase the pedestrian crossing time. Therefore the secondary impact of implementing this mitigation to other modes of travel would be less than significant. **MM 4.4.5e** could not be implemented within the existing intersection right-of-way. Additional right-of-way would be needed to widen the eastbound approach at the intersection. In addition, widening the eastbound approach would increase the pedestrian crossing time, resulting in secondary impacts on pedestrians.	SU/LS

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LS – Less Than Significant ***S - Significant*** ***CC – Cumulatively Considerable***

Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
		MM 4.4.5f The City of Pittsburg shall cooperate with City of Concord to amend the Bailey Road Traffic Mitigation Measure Inter-Agency Funding Agreement to include the proposed developments included in the Pittsburg/Bay Point BART Master Plan. Future development projects in the Master Plan Area shall contribute their fair share to implement the identified improvements. *Timing/Implementation: Payment of future development projects' fair share shall be made prior to issuance of building permits or in accordance with any future agreements between the the City of Concord and Pittsburg.* *Enforcement/Monitoring: City of Pittsburg Development Services Department and City of Concord*	CC/SU
4.5 Noise			
Impact 4.5.5 Groundborne vibration levels associated with pile-driving activities, if required, could exceed applicable groundborne vibration criterion at nearby land uses. This impact would be **potentially significant**.	PS	**MM 4.5.5** Impact pile-driving equipment used within 160 feet of nearby structures shall be substituted with equipment or procedures that would generate lower levels of groundborne vibration, to the extent that geological conditions would permit their use. For instance, in comparison to impact pile drivers, drilled piles or the use of a sonic or vibratory pile drivers are preferred alternatives. In the event that the use of impact pile drivers is required due to geological conditions, groundborne vibration monitoring shall be conducted for impact pile driving that occurs within 160 feet of existing structures. Pile-driving activities shall be suspended if measured groundborne vibration levels approach within 0.1 in/sec ppv of commonly applied threshold of 0.5 in/sec ppv for structural damage. In such instances, additional attenuation measures or changes in pile-driving techniques shall be implemented, prior to recommencing pile-driving activities, to reduce groundborne vibration levels. For impact pile-driving activities that occur within approximately 75 feet of existing structures, a building conditions survey shall be conducted for existing structures in order to document existing structural conditions. Any structural damage resulting from nearby impact pile-driving activities shall be repaired in a timely manner by the developer. The building conditions survey shall be conducted by a licensed professional engineer and shall include pre- and post-construction surveys. The surveys shall, at a minimum, include the following:	SU

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LS – Less Than Significant ***S - Significant*** ***CC – Cumulatively Considerable***

Impact	Level of Significance Without Mitigation	Mitigation Measures	Resulting Level of Significance
		a. Photographic and videotape documentation of the interior and exterior condition of the building(s); b. The extent and location of existing signs of building distress such as cracks, spalling, signs of settlement, flooding, leaking, etc. *Timing/Implementation:* *As a Condition of Approval for any building or construction permit for the parking garages.* *Enforcement/Monitoring:* *City of Pittsburg Development Services Department*	
4.6 Air Quality			
Impact 4.6.3 Subsequent land use activities associated with implementation of the proposed Master Plan could result in long-term, operational emissions that could violate or substantially contribute to violations of federal and state ambient air quality standards. This impact is considered to be **potentially significant.**	PS	**MM 4.6.3** To the greatest extent feasible, future development proposals in the Master Plan Area shall comply with the City's adopted Green Building Design Guidelines, or any applicable City green/efficient building regulations which are in effect at the time of development. *Timing/Implementation:* *Prior to issuance of Building Permits.* *Enforcement/Monitoring:* *City of Pittsburg Development Services Division.*	SU
Impact 4.6.7 Implementation of the proposed Master Plan, in combination with cumulative development in the SFBAAB, would result in a cumulatively considerable net increase of ozone and coarse and fine particulate matter. This is considered a **cumulatively considerable impact.**	CC	Implementation of mitigation measure **MM 4.6.3.**	CC / SU

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LS – Less Than Significant *S - Significant* *CC – Cumulatively Considerable*

3.0 PROJECT DESCRIPTION

This section provides a detailed description of the Pittsburg/Bay Point BART Master Plan. This section has been prepared in accordance with California Environmental Quality Act (CEQA) Guidelines Section 15124, which details the requirements and contents of an EIR project description under CEQA.

3.1 PROJECT LOCATION, OWNERSHIP, AND CURRENT USE

LOCATION

The proposed project is a Master Plan for an area of the City of Pittsburg (see **Figure 3.0-1**) approximately 50.6 acres in size, encompassing the whole of Assessor's Parcel Numbers (APN) 097-160-044, -45, and -049 as well as the majority of APN 097-160-041. The only portion of APN 097-160-041 that lies outside the Master Plan area is the northern 2.5 acres (approximate) containing the approach and exit ramps for the existing Bay Area Rapid Transit (BART) station. The approach and exit ramps are not a part of the project and would not be modified by the proposed Master Plan. The project is located approximately 700 feet southwest of the intersection of State Route (SR) 4 and Bailey Road and is bounded by SR 4 to the north, the Oak Hills Shopping Center to the east, West Leland Road to the south, and the Alves Ranch project area to the west (**Figure 3.0-2**). The city boundary is located along SR 4, just north of the Master Plan area. The area north of SR 4 lies within unincorporated Contra Costa County in the community of Bay Point.

PROPERTY OWNERSHIP

The Master Plan area is currently owned by two entities. APN 097-160-049, comprising approximately 23.4 acres in the western half of the project area, is owned by West Coast Home Builders (WCHB). BART owns the remainder of the Master Plan area, an area approximately 27.2 acres in size, containing APNs 097-160-041, -044, and -045.[1]

CURRENT USE

The portion of the Master Plan area owned by WCHB is currently unimproved but has been previously graded. The remainder of the Master Plan area, those portions owned by BART, contains surface parking, landscaping, and bus/pedestrian pick-up/drop-off facilities for use by commuters using the local bus system and the BART station. The BART station itself is located north of the Master Plan area on an elevated structure located between the east- and westbound lanes of SR 4. However, facilities for the use of commuters are located inside the Master Plan area, including surface parking lots, bus pick-up lanes, and a small retail structure near the entrance to the station itself. Also located on the BART property is a man-made stormwater detention basin, approximately 1.0 acre in size. The detention basin is located in the center of the Master Plan area next to its northern boundary, immediately south of SR 4 and the northwest corner of the BART parking lot. See **Figure 3.0-3** for a depiction of the Master Plan area's current uses as well as adjacent uses.

According to the General Plan Land Use Diagram for the City of Pittsburg, the entire Master Plan area is designated for Mixed Use (City of Pittsburg 2001). The Mixed Use designation is established by the General Plan to allow for greater flexibility in development in the vicinity of transit uses. The General Plan allows for densities of up to 65 units per gross acre and a maximum floor area

1 Approximate area does not include the portion of APN 097-160-41 that lies outside the Master Plan area.

ratio (FAR) of 1.0. However, the General Plan allows for greater density with the adoption of the Pittsburg/Bay Point BART Station Area Specific Plan (City of Pittsburg, 2001; p. 2-18).

SURROUNDING LAND USES

The Master Plan area is surrounded on three sides (north, west, and south) by existing urban development and on the west by approved urban development projects (see **Figure 3.0-3**). SR 4 lies immediately north of the Master Plan area, with existing urban development to the north of SR 4. Situated in the middle of SR 4 is the existing BART station, including passenger loading and unloading areas and the train tracks. Immediately north of that point and north of SR 4 are various residential uses located within the Bay Point neighborhood of Contra Costa County. The Oak Hills Shopping Center, comprising an existing local shopping center including several buildings and surface parking along Bailey Road, lies immediately east of the Master Plan area. Bailey Road and more residential development are located immediately east of the shopping center. West Leland Road is located immediately adjacent to the Master Plan area to the south, across which are single-family homes and some multi-family residential uses (southwest). West of the Master Plan area, immediately adjacent to the parcel owned by WCHB, is the Alves Ranch project, a development with residential and commercial uses approved by the City in 2009 but not yet constructed (see Section 4.0, Assumptions, for more information on Alves Ranch).

T:_GIS\CONTRA_COSTA_COUNTY\MXDS\BART\EIR\FIGURE 3.0-1 REGIONAL.MXD - 8/24/2009 @ 3:04:21 PM

Figure 3.0-1
Regional Location

PMC

T:_GIS\CONTRA_COSTA_COUNTY\MXDS\BARTEIR\FIGURE 3.0-2 PROJECT SITE.MXD - 3/24/2011 @ 10:03:35 AM

750 0 750

FEET

N

Figure 3.0-2
Master Plan Area Location

PMC

T:_GIS\CONTRA_COSTA_COUNTY\MXDS\BART\EIR\FIGURE 3.0-3 LAND USE.MXD - 8/25/2009 @ 3:05:02 PM

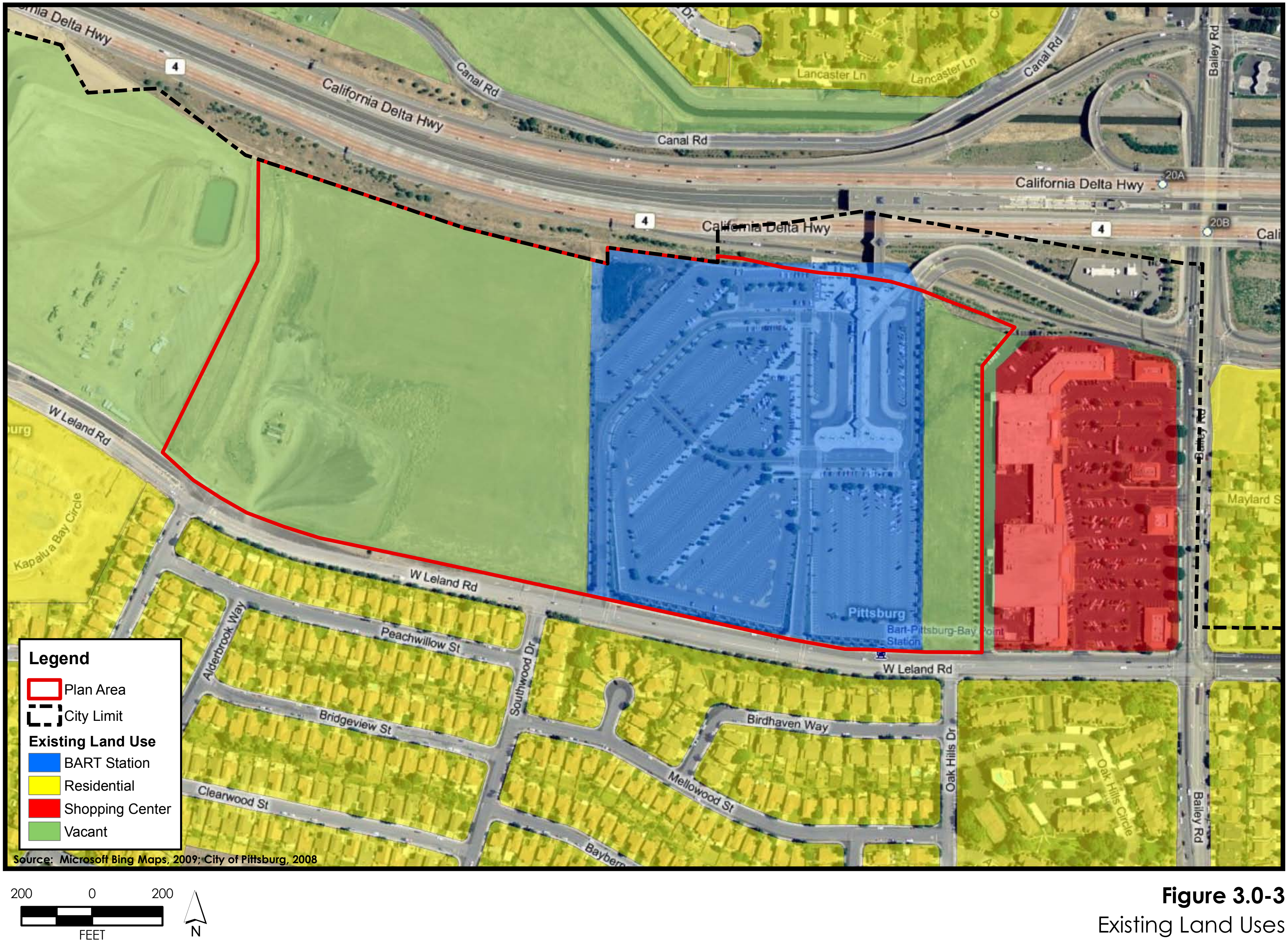


Figure 3.0-3
Existing Land Uses

PMC

3.2 EXISTING CONDITIONS

The general condition of the Master Plan area is discussed herein. However, detailed descriptions of existing conditions for each topic area of analysis are included in the representative sections of this DEIR (Section 4.1 through 4.13). See the appropriate section of this DEIR for more detailed discussion of existing conditions as they apply to each topic area.

The Master Plan area contains four parcels, three of which are owned by BART and one owned by WCHB. See **Table 3.0-1** below for the current disposition of each parcel.

TABLE 3.0-1
PARCELS IN THE MASTER PLAN AREA AND THEIR CURRENT CONDITION

Parcel (APN)	Ownership	Developed?	Existing Use/Condition
097-160-041	BART	Yes	BART station, parking, bus shelters, approach ramp from Bailey Road
097-160-044	BART	Yes	Parking lots and stormwater detention basin
097-160-045	BART	No	Unimproved, aside from fencing and a sidewalk
097-160-049	WCHB	No	Shows signs of grading, but contains no improvements aside from curb, wire barriers, and a sidewalk

Those portions of the Master Plan area that contain BART facilities include typical improvements for such a station, including:

- Paving of the majority of the site in asphalt for parking vehicles;
- Internal concrete curbs and sidewalks;
- Earthen detention basin for stormwater;
- Bus shelters and approach ramps;
- Iron fencing (between BART uses and undeveloped parcels); and
- Landscaping.

In addition to the features described by the list above, the two BART station parcels (APNs 097-160-041 and -044) include sidewalks along West Leland Road and some limited frontage landscaping. Also located along the southern boundary of these two parcels is a 4-foot tall (approximate) iron fence, limiting pedestrian access into the BART station parking lot to sidewalks adjacent to the two vehicle entrances. The existing parking lot sits approximately 6 feet lower than the roadway surface of West Leland Road. The transition is made possible by a retaining wall between the roadway right-of-way and the parking lot surface, itself located entirely within the BART property.

APN 097-160-045 is unimproved aside from a 6-foot (approximate) iron fence along the adjacent developed parcel to the east and a 4-foot wire fence along West Leland Road to the south. The portion of the parcel adjoining West Leland Road includes a sidewalk but no landscaping.

APN 097-160-049 comprises the approximate western half of the Master Plan area. This parcel is currently undeveloped except for curbs along West Leland Road, a 4-foot (approximate) post and wire barrier, and a small portion of sidewalk located at the intersection of West Leland Road and Woodhill Drive. Pedestrians are directed by signage to cross from the north side to the south side of West Leland Road at Woodhill Drive before walking eastward toward Bailey Road. However, significant signs of pedestrian traffic in the dirt along the north side of West Leland Road were evident during a site visit by PMC staff in August 2010. Additionally, while the parcel is relatively unimproved, some limited grading has occurred in the past, evidenced by a large area of bare gravel as well as a large soil stockpile on the western boundary that appears to partially encroach on the Master Plan area.

Three of the parcels within the Master Plan area directly adjoin the right-of-way for SR 4. A California Department of Transportation (Caltrans) standard barrier fence comprising chain-link topped by barbed wire separates the Master Plan area from the right-of-way.

In general, the Master Plan area exhibits flat topography, changing in elevation slightly from approximately 200 feet above mean sea level (msl) in the southwest corner to approximately 150 feet above msl along the northern boundary. The topography slopes from the south to the north. For specific site geology and soils information, see Section 4.7, Geology and Soils, of this DEIR.

The Master Plan area is not crossed by any creeks, streams, or natural water bodies. There are small cement-lined drainages on the eastern and western borders of the BART property. In addition, a cement-lined detention basin is located in the center of the Master Plan area next to its northern boundary, immediately south of SR 4 in the northwest corner of the BART parking lot. This basin receives stormwater runoff from the developed BART parcels, which then flows north under State Route 4 via a cement culvert and into another detention basin.

Vegetation in the Master Plan area is limited to typical urban landscaping in the developed parcels and native and non-native grasses in the undeveloped portions. Site visits made by PMC staff in April 2009 and August 2010 recorded evidence of small lizards and mammals (such as mice) as well as hawks and other birds of prey flying overhead. For a more detailed description of the biological resources found in the Master Plan area, see Section 4.9, Biological and Natural Resources, of this DEIR.

According to historic aerial photography, the Master Plan area was largely undeveloped in June 1993 (Google 2010). By October 30, 2002, the BART station and its associated parking had been constructed, but the remainder of the Master Plan area was left in its unimproved state. The October 2002 photograph indicates the presence of some sort of holding tanks and a dirt road on the WCHB property near the intersection of West Leland Road and Woodhill Drive. It is still present in the most recent aerial photograph (October 2009). However, no evidence of these tanks was observed in the August 2010 site visit.

3.3 PROJECT OBJECTIVES

The following objectives have been identified by the City for the proposed Master Plan:

1) Establish the BART station area as a regional focal point;

2) Reduce greenhouse gas emissions and automobile trips by promoting sustainable development characterized by a mix of uses and a circulation system that prioritizes pedestrians, bicyclists, and transit riders over single-occupancy vehicles;

3) Increase transit ridership by developing a multimodal transit hub;

4) Improve security on the BART property and in the surrounding community by increasing the eyes on the street through increased density and implementing crime prevention through environmental design principles and improved access and connectivity;

5) Foster healthy lifestyles by supporting walking and bicycling and improving pedestrian and bicycle linkages to/from the BART station;

6) Support economic development by facilitating access to existing commercial development and by providing commercial and retail development to support BART patrons, new residents of the transit-oriented development (TOD), and residents of the surrounding neighborhoods;

7) Maintain flexibility in the plan by creating a “flex space” land use designation that can be used as future commercial, office, or residential uses, depending on future market conditions and demand;

8) Improve employment opportunities for local residents by increasing commercial development and supporting and linking to existing commercial uses around the station;

9) Support a range of housing types to support the diverse needs of the community and maximize housing opportunities for all income levels, age groups, and abilities;

10) Create attractive, usable, and inviting public spaces; and

11) Build a sense of community and of place through good architecture and design of public and private spaces.

3.4 PROJECT CHARACTERISTICS

PROPOSED USES

The proposed Master Plan would guide construction of mixed-use development in the vicinity of the existing BART station. Land uses proposed by the Master Plan are listed in **Table 3.0-2** below. As a Master Plan, the proposed project does not mandate detailed requirements for each building or use, but rather gives general guidelines for future uses which will be applied by the City to future project proposals in the Master Plan area. Throughout the life of the Master Plan—expected to be a period of 20 years—market pressures and other concerns may result in some variation in development use and intensity. To this end, a range of uses and densities is listed by the proposed Master Plan. For the purposes of CEQA analysis, a series of assumptions were applied to the various land uses to determine a buildout density that was used in the analyses presented in the following sections of this DEIR (Sections 4.1 through 4.13). These assumptions pointed to future development of 1,168 dwelling units and 146,362 square feet of non-residential development employing 1,300 persons. For more information on how the assumptions used by this DEIR were formulated, see Section 4.0, Assumptions.

Along with medium- and high-density residential land uses designations, the Master Plan includes a Flex designation. Development in the Flex land use designation would be given the widest range of allowed uses and densities according to what market pressures and other concerns are in effect at the time of development. Flex uses can include residential, retail, office, quasi-public, and other uses, based on what can be supported by the existing needs and development requirements.

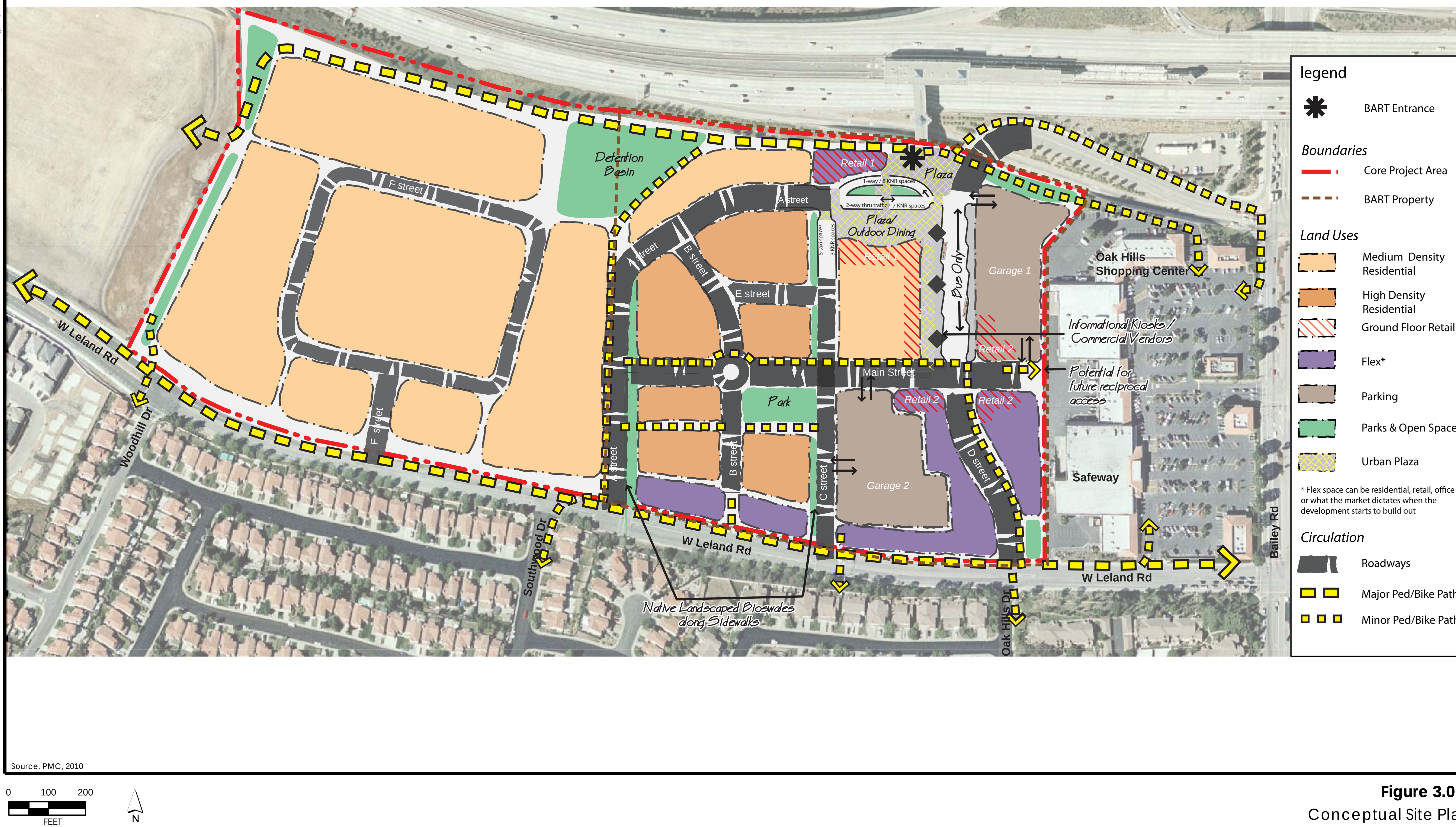
TABLE 3.0-2
PROPOSED LAND USES – MASTER PLAN AREA

Land Use	Acres		
	Master Plan Area	WCHB Property	BART Property
Medium Density Residential	20.2	17.8	2.4
High Density Residential	4.2	0.0	4.2
Residential Subtotal	*24.4*	*17.8*	6.6
Flex	2.9	0.0	2.9
Ground-Floor Retail	1.3	0.0	1.3
Nonresidential Subtotal[1]	*2.9*	*0.0*	*2.9*
Urban Plaza	1.1	0.0	1.1
Park	0.4	0.0	0.4
Detention Basin[2]	1.8	0.8	1.0
Parking Garage 1	1.5	0.0	1.5
Parking Garage 2	1.8	0.0	1.8
Other[3]	16.7	4.8	11.9
Subtotal	*23.3*	*5.6*	*17.7*
Project Total	**50.6**	**23.4**	**27.2**

Notes: [1]*The acreage for non-residential uses is not a sum of the Flex and the Ground-Floor Retail uses because it is assumed that the retail will occupy the ground floor of the development with flex uses above.*
[2]*The Detention Basin acreage includes landscaping and fencing around that feature. See Section 4.9, Biological and Natural Resources, for a discussion of the actual proposed size of the basin and its disposition.*
[3]*Other uses include the kiss-and-ride area, bus pick-up, and bus-only lanes as well as landscaping, sidewalks, and roadway improvements to the centerline of roads adjacent to nonresidential uses. These uses, which include the street network, comprise approximately 33% of the Master Plan area, consistent with General Plan assumptions for roadway land area (City of Pittsburg, p 4-44).*

PROJECT LAYOUT

The land use plan for the Master Plan is shown in **Figure 3.0-4**. As shown in this figure, the project proposes a mixture of uses designed to provide a cohesive development centered on the BART station and the pedestrian and vehicle traffic created by that existing use.



Source: PMC, 2010

Figure 3.0-4

Conceptual Site Plan

PMC

West Coast Home Builders Property

The West Coast Home Builders property is described in the Master Plan as medium-density multi-family residential development served by a single loop road and one access point onto West Leland Road. According to the Master Plan, the WCHB property would include approximately 17.8 acres of medium-density residential development along with a ring road to serve those residential uses. Furthermore, the WCHB property would include an expansion to the existing detention basin in the north of the Master Plan area by approximately 0.5 acres. Additional features described by the Master Plan include a landscaped strip along the western boundary of the Master Plan area and various pedestrian/bicycle pathways and connections (see **Figure 3.0-4**).

Preliminary designs submitted by Discovery Builders, a construction firm secured by WCHB to develop the site, indicate a typical apartment design consistent with the description above. Included in the preliminary designs are landscaping, surface parking with carports for tenant parking, a central plaza with private recreational uses for residents (including a pool and clubhouse), and a gated entryway limiting access to residents and guests. However, as this preliminary design does not constitute an application for land use permits or other entitlements, the uses and on-site circulation system shown in **Figure 3.0-4** were assumed during preparation of this DEIR.

BART Property

The portion of the Master Plan area owned by BART is described by the proposed Master Plan to include several significant features, including:

- Two parking garages to replace surface parking removed for development of other uses on the site.
  - Garage 1, in the northeastern portion of the Master Plan Area and closest to the BART station, will be six stories in height and include street-level retail in the southwest corner of the structure.
  - Garage 2, to be located south of the BART station in close proximity to West Leland Road, will be a four- or five-story garage, depending on the needs of development in the Master Plan area.
- Flex uses constructed south of Parking Garage 1 and surrounding Parking Garage 2 that may include any mix of residential, commercial, or quasi-public uses, with ground-floor retail uses along Main Street and D Street.
- An area of medium-density residential development with ground-floor retail uses immediately north of Parking Garage 2, adjoining a plaza to be located along the kiss-and-ride area (see below).
- An area of flex uses on the northern boundary immediately adjacent to the BART station, including ground-floor retail uses.
- Areas of medium- and high-density development encompassing the western half of the BART property.

- A 0.4-acre (approximate) park located adjacent to a major intersection in the Master Plan area and substantially surrounded by a high-density residential area.

- A series of landscaped corridors along some internal roadways.

- A roadway network throughout the BART property providing a grid-like interconnected network with three connections to West Leland Road.

- A kiss-and-ride plaza area for the use of vehicles picking up BART passengers.

- A bus-only lane and shelter along Parking Garage 1, utilizing the existing approach ramp on the northern side of the Master Plan area.

- A network of pedestrian/bicycle pathways throughout the project as well as connections to both West Leland Road to the south and the Oak Hills Shopping Center via the bus approach ramp to the east. Also included is a pedestrian connection from the BART property along the northern part of the medium-density residential uses described for the WCHB property, and connecting to planned roadways in the Alves Ranch project.

PROJECT ACCESS AND CIRCULATION

The Master Plan proposes a network of on-site roadways to provide access and circulation among uses to be constructed as part of the Master Plan (see **Figure 3.0-4**). In some cases, these roadways correspond with existing travel lanes on the BART property. However, in all cases the roadways would be modified and expanded to serve the capacity required by the Master Plan. These roads are identified in the Master Plan by letter, though the eventual name of these roadways may be different. They include:

- **A Street** – Connecting to West Leland Road immediately east of the existing intersection at Southwood Drive and West Leland Road. A Street corresponds to an existing roadway on the BART property, leading to the station. Adjacent to sidewalks on A Street is a proposed vegetated stormwater swale.

- **B Street** – Connecting the rear (north) side of Flex uses along West Leland Road through the high-density residential developments and a planned traffic circle northward to A Street. The proposed park would be located on the east side of B Street immediately south of the traffic circle.

- **C Street** – Connecting to West Leland Road at the midline of the BART property northward into the kiss-and-ride plaza area. C Street corresponds to an existing roadway on the BART property. The east side of C Street includes a proposed vegetated stormwater swale.

- **D Street** – Connecting to West Leland Road immediately west of the Oak Hills Shopping Center and leading northward through the flex uses to Main Street. This is a new roadway to be constructed on the previously undeveloped BART parcel. The northern half of D Street is a bus-only roadway providing bus access to the bus shelters and the northern approach ramp.

- **E Street** – Connecting B Street with C Street, through the high-density residential development.

- **F Street** – A loop street serving the medium-density residential development proposed for the WCHB property. F Street would connect to West Leland Road approximately midway between the existing intersections on West Leland Road with Southwood Drive and Woodhill Drive.

- **Main Street** – Connecting to A Street and extending toward the eastern property line at the back of the Oak Hills Shopping Center. Main Street includes a traffic circle at B Street and provides the main east-west circulation through the BART portion of the Master Plan area.

On-site roadways are only preliminary, and no specific designs for roadways have been developed or proposed by the Master Plan. However, the Master Plan does include some sample cross-sections of the roadways identified as part of the circulation network depicted in **Figure 3.0-4**. All roadways include pedestrian sidewalks and landscaping. Also included in the proposed Master Plan are proposed pedestrian/bicycle paths providing internal circulation as well as connections to the neighboring Oak Hills Shopping Center, West Leland Road, Alves Ranch, and residential neighborhoods south of West Leland Road. Refer to **Figure 3.0-4** for the proposed location of these paths.

PROJECT PHASING

The Master Plan proposes development that may take up to 20 years to completely build out. In order to provide for orderly development and to ensure the viability of development in the Master Plan area during development, the proposed Master Plan includes the following development phasing, as shown on **Figure 3.0-5.**

Phase 1

- Construction of C and D streets;

- Construction of temporary parking as well as bus stops, taxi-loading, and kiss-and-ride on the vacant lot east of the existing BART parking areas;

- Construction of senior and market-rate housing, ground-floor retail, and flex uses on the existing intermodal and plaza site; and

- Improvements to pedestrian/bicycle pathways along the BART access road to Bailey Road and from the BART station along the northern part of the Oak Hills Shopping Center.

Phase 2

- D street north of Main Street becomes bus-only route;

- Construction of Parking Garage 1; and

- Construction of ground-floor retail co-located with Garage 1.

Phase 3

- Construction of high-density residential uses north of Main Street and west of C Street.

Phase 4

- Construction of Parking Garage 2 wrapped with flex and ground-floor retail along Main Street, completing the gateway from West Leland Road into the Master Plan Area;
- Construction of flex and ground-floor retail uses south of Main Street and east of D street; and
- Construction of West Leland Road frontage improvements between the eastern property line and C Street.

Phase 5

- Completion of West Leland Road frontage improvements;
- Construction of flex uses along West Leland Road between C Street and A Street;
- Construction of high-density residential and community park between C and A streets, south of Main Street.

Any Time During Project Life[2]

- Construction of all WCHB improvements (medium-density residential, parking, garages, private roads, etc.).

RELATIONSHIP TO LOCAL PLANS

City of Pittsburg General Plan

The City of Pittsburg General Plan was adopted in 2001 and substantially updated over the years, with the latest update approved in July 2010. According to the Pittsburg General Plan, the whole of the Master Plan area is designated for Mixed Use land uses. The Mixed Use designation is defined in the General Plan as follows:

> [Mixed Use] applies to approximately 50 acres located west of the Oak Hills Shopping Center, and includes the Pittsburg/Bay Point BART Station parking lot. Residential densities up to 65 units per gross acre, or as approved by the Pittsburg/Bay Point BART Station Area Specific Plan, are allowed on these properties. Maximum FAR for non-residential development is 1.0, or as approved by the Specific Plan.

[2] Because any infrastructure or other appurtenances serving the WCHB site will be the sole responsibility of WCHB to provide, and because it cannot be known when during the project lifetime WCHB will decide to develop the property, this portion of the Master Plan area is not included in the normal phasing plan.

T:_CS\Work\Pittsburg, City of\Baypoint BART 29-0021\Figures

Phase 1

- Garage 1 site (currently vacant) will serve as bus, taxi loading and kiss-n-ride until A street kiss-n-ride and D streets are complete
- South of Garage 1 site will become available for surface parking, and/or construction parking/materials.
- D street is open to through traffic
- Construction of senior and market-rate housing, ground floor retail, and flex on existing intermodal and plaza site
- Improvements to pedestrian/bicycle pathways along the BART Access Road to Bailey Road, and from the BART site along the northern part of Oak Hills Shopping Center.

Phase 2

- North segment of D street will become bus only
- Construction of Garage 1, ground floor retail, and flex space south of Garage 1 to Leland (as gateway) on vacant BART site
- Phase 1 residential will support and complement new flex use and retail

Phase 3

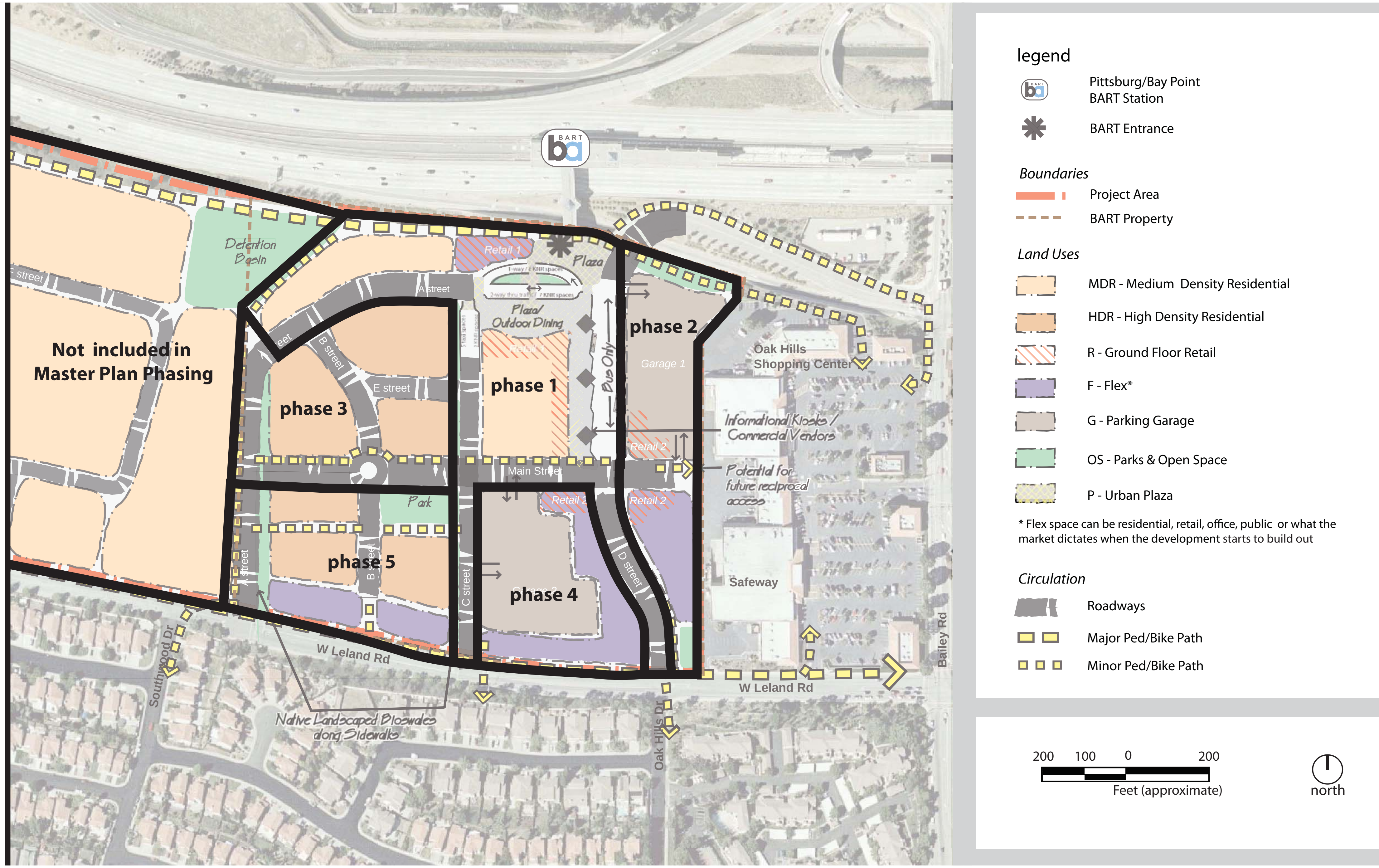
- New high density residential development in northwest quadrant of BART site
- Completion of Main street and E street and portions of B street and A street.

Phase 4

- Construction of Garage 2 wrapped with flex and ground floor retail along Main street. This will complete the gateway into the sight from Leland.

Phase 5

- Completion of Leland street frontage, with flex fronting Leland, and high density residential and community park located behind.
- Completion of A street and B street.



Source: PMC, 2010

Figure 3.0-5

Phasing Diagram

PMC®

While the City has not adopted the Specific Plan prepared by the County and referenced in the excerpt above, the proposed Master Plan has been prepared to meet the intent of the Specific Plan Adopted General Plan Goals and Policies support the development of the Master Plan for high density, mixed use development in close proximity to the existing Pittsburg/Bay Point BART Station that is pedestrian and bicycle friendly, incorporates a mix of uses, and contains high intensity and high density residential uses (2-G-4, 2-P-94, 4-P-59, 13-P-1.4A, and 13-P-1.4E). The General Plan land use designations for the Master Plan area and surrounding properties are shown in **Figure 3.0-6**.

City of Pittsburg Municipal Code

Title 18 of the Pittsburg Municipal Code, referred to as the Zoning Code, is consistent with the General Plan in regards to the Master Plan Area. The Master Plan Area is designated for Mixed Use. The Zoning Districts for the Master Plan Area and surrounding properties is shown in **Figure 3.0-6**.

Pittsburg/Bay Point BART Station Area Specific Plan

In June 2002, the Contra Costa County Board of Supervisors adopted the Pittsburg/Bay Point BART Station Area Specific Plan (Contra Costa County and City of Pittsburg, 2002), which included parts of Pittsburg and the Bay Point neighborhood in its project area. The Specific Plan was designed to guide development in an area in the vicinity of the BART station roughly 295 acres in size. The Master Plan is roughly congruous with Area 1 of the Specific Plan, described therein as development of residential and commercial mixed use, including multi-family residential, parks, and other limited recreational uses. The Specific Plan described up to 1,790 units in Area 1 along with 125,000 square feet of commercial development. Also included in planning for Area 1 was at least one parking garage.

Contra Costa County adopted the Pittsburg/Bay Point Specific Plan. However, the City of Pittsburg did not. No entitlements have been granted by the City of Pittsburg according to the Specific Plan. The Specific Plan concerns an area much greater in size than the Master Plan, including significant portions that lie outside the City of Pittsburg. While the Master Plan is a separate document from the Specific Plan, it is important to note that the proposed Master Plan is generally consistent with the intent of the Specific Plan for the same property.

APPROVALS

The proposed Pittsburg/Bay Point BART Master Plan will require adoption by the City prior to any site disturbance or other improvement. However, no other approval is being sought at this time. The project proponent for the Master Plan is the City of Pittsburg. Once the Master Plan is approved, it is assumed that the property owners, or their successors, will come forward with proposals for development consistent with the Master Plan, at which time further approvals will be required. These may include, but are not limited to:

- Rezoning to Master Plan Overlay District
- Amendments to the Mixed Use District regulations set forth in Pittsburg Municipal Code (PMC) chapter 18.53
- Authorization of a Joint Powers Authority (JPA) Agreement by and between the City, BART and other applicable parties

- Design Review
- Tentative Subdivision Map(s)
- Final Map(s)
- Grading Permit(s)
- Development Permit(s)
- Improvement Plans
- Building Permit(s)
- Occupancy Permit(s)

It is expected that these future approvals may require additional entitlements from agencies outside the City of Pittsburg, including but not limited to:

- Approval of future development proposals on BART property by BART.
- National Pollutant Discharge Elimination System (NPDES) Construction Activity General Permit – Requires the applicant to file a public Notice of Intent to discharge stormwater and to prepare and implement a stormwater pollution prevention plan (SWPPP)
- NPDES General Permit for Stormwater Discharges – Requires that discharges of pollutants from areas of new development be reduced to the maximum extent practicable in order to protect receiving waters and uphold water quality standards

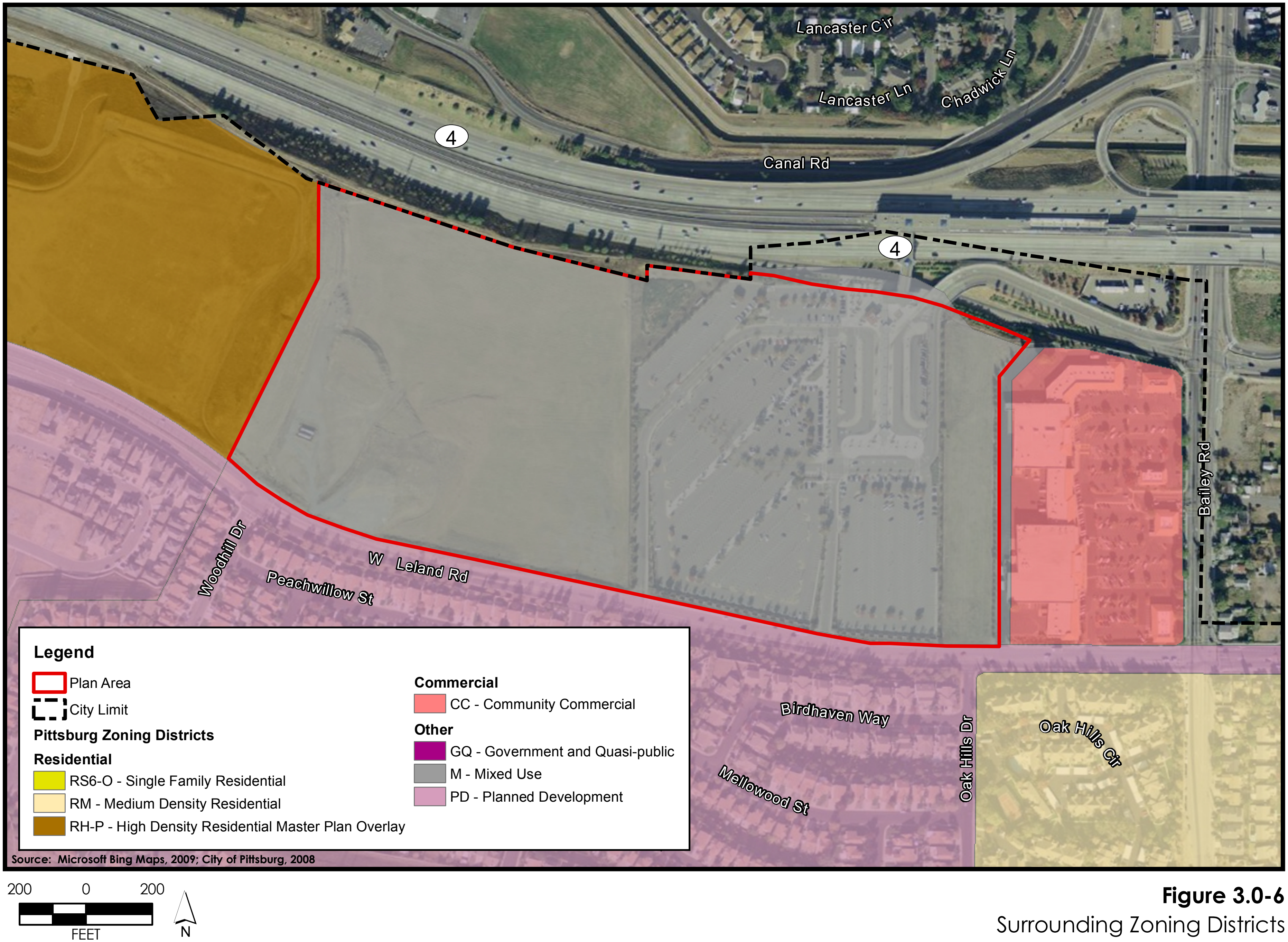


Figure 3.0-6
Surrounding Zoning Districts

PMC

REFERENCES

Contra Costa County and City of Pittsburg. 2001. Pittsburg/Bay Point BART Station Area Specific Plan Environmental Impact Report (Recirculated). Prepared in conjunction with Bay Area Rapid Transit. SCH 98022071.

———. 2002. Pittsburg/Bay Point BART Station Area Specific Plan. Prepared in conjunction with Bay Area Rapid Transit.

City of Pittsburg. 2001. Pittsburg 2020: A Vision for the 21st Century. City of Pittsburg General Plan. Includes Amendments through July 2010.

———. 2010. Municipal Code.

Google, Inc. 2010. Historical photographs presented via Google Earth. http://earth.google.com (retrieved online August 2010).

PMC, 2009, April 28. Reconnaissance-level field survey of the Master Plan Area. Performed by PMC biologist.

———. 2010, August. Site visits by a PMC Environmental Planner, including photographs.

4.0 ASSUMPTIONS

The following is an introduction to the project-specific and cumulative environmental impacts analysis and general assumptions used in the analysis. The reader is referred to the individual technical sections of this Draft Environmental Impact Report (Draft EIR or DEIR) regarding specific assumptions, methodology, and significance criteria used in the analysis.

4.1 ANALYSIS ASSUMPTIONS GENERALLY USED

BASELINE ENVIRONMENTAL CONDITIONS ASSUMED IN THE DRAFT EIR

Section 15125(a) of the California Environmental Quality Act (CEQA) Guidelines requires that an EIR include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the Notice of Preparation (NOP) is published. The State CEQA Guidelines also specify that this description of the physical environmental conditions is to serve as the baseline physical conditions by which a lead agency determines whether impacts of a project are considered significant.

The environmental setting conditions of the Master Plan area and the surrounding area are described in detail in the technical sections of this DEIR (see Sections 4.1 through 4.13). In general, these setting discussions describe the existing conditions of the Master Plan area and the surrounding area as they existed when the NOP and Initial Study for the project were released in December 2010. In addition, where appropriate the DEIR also includes updated setting information since release of the NOP and Initial Study, such as the status of proposed and approved large-scale development projects in the region (see Approach to the Cumulative Impact Analysis subsection below).

GENERAL PLAN CONSISTENCY ANALYSIS

As required by CEQA Guidelines 15125(d), each technical section of the DEIR (Sections 4.1 through 4.13) has been evaluated for consistency with policies contained in the existing Pittsburg General Plan (2001, as amended through 2010).

PITTSBURG/BAY POINT BART STATION AREA SPECIFIC PLAN

The proposed project is located within the plan area of the Pittsburg/Bay Point BART Station Specific Plan (the Specific Plan) (Contra Costa County and City of Pittsburg 2002). However, the Specific Plan was adopted by Contra Costa County and not the City of Pittsburg. Although the Specific Plan is a County document and thus has no bearing on the Master Plan area, the uses described by the Specific Plan for the Master Plan area (see Section 3.0, Project Description, of this DEIR) are generally consistent with the Specific Plan. However, as the City has not adopted the Specific Plan, the technical sections of this DEIR will not include a consistency analysis for the plans and policies presented in the Specific Plan.

PROJECT CONSTRUCTION EFFECTS

The proposed project is a Master Plan, identifying proposed land uses within the Master Plan area. Should the project be approved by the Pittsburg City Council, specific projects within the Master Plan area may be proposed for development consistent with the Master Plan, General Plan, and Zoning Code policies and standards. These proposals would be subject to individual City review and approval. It is at the time of such development that construction impacts would occur. The analysis presented in the technical sections of this DEIR (Sections 4.1 through 4.13) includes general, or programmatic, consideration and discussion of construction effects. Where effects were found to be potentially significant, mitigation measures have been included to reduce potential construction effects to the greatest extent feasible.

Project Buildout Assumptions

The proposed Master Plan includes specific land use designations for the site as well as designations for other features such as pedestrian/bicycle pathways, roadways, plazas, parks, and other features (see Section 3.0, Project Description). Because the land uses allowed in the Master Plan include a variety of development types and densities, as well as flex uses that can include a range of uses in a single location/structure, an assumed level of buildout must be determined in order to guide the analysis of the proposed Master Plan presented in this DEIR. To this end, a series of assumptions were applied to the acres of each land use designation indicated in the Master Plan area (see Table 3.0-2). For medium- and high-density residential, it was assumed that a density of 85 percent of the allowable dwelling units per acre would be constructed, resulting in an average density of 42 dwelling units per net acre of medium-density residential and 60 dwelling units per net acre of high-density residential.

In regard to flex uses, it is assumed that those areas designated for flex uses will develop at approximately 37 percent medium-density residential, 13 percent high-density residential, 25 percent retail/commercial (not including required ground-floor retail), 17 percent office uses, and 8 percent quasi-public uses. The proportions of these uses assumed by this analysis were formulated according to average land use mixes in similar communities throughout the state. The Master Plan includes specific areas for ground-floor retail, which were not factored as part of the flex uses. It is assumed in the buildout figures that such retail uses would be constructed with flex uses above. Therefore, the net acres of ground-floor retail were not figured into the total of all land uses presented in Table 3.0-2.

Residential portions of the Flex land use designation were assumed to develop at the same density as non-flex residential uses in the Master Plan area—42 dwelling units per net acre of medium-density residential and 60 dwelling units per net acre of high-density residential. For nonresidential portions of flex uses, the representative proportions of those uses were applied to national averages for employees generated per acre. For example, the national average for retail uses is approximately 500 employees per acre. As retail uses are expected to make up 25 percent of all flex uses in the Master Plan, it was assumed that for each acre of flex uses in the Master Plan area, 125 retail employees would be generated. For the total of all nonresidential uses in the Flex land use designation, it is assumed that 224 employees will be generated. For ground-floor retail areas, the full national average generation rate for employees (500 per acre) was assumed.

To determine the amount of floor area generated by these nonresidential uses, it was assumed that construction would average 80 percent of the allowable floor area ratio (FAR). In the case of ground-floor retail, it is assumed that the FAR would average 0.8. For flex uses, a FAR of 1.6 is assumed.

It is important to note that the above assumptions are based on averages. It is expected that some development in the Master Plan area would exceed the assumed density/intensity discussed herein and some would be lower in density/intensity. A mid- to high-range assumption for development is supported by the General Plan (City of Pittsburg General Plan 2020: Draft Environmental Impact Report, 2-4). In addition, because the Master Plan is a focused plan developed to support a multi-modal environment, the kiss-and-ride area, bus pick-up, and bus-only lanes as well as the street network (all comprising approximately 33% of the Master Plan area) were subtracted from the land considered in **Table 4.0-1** and **2**, below. According to the best available information, the proposed Master Plan is expected to result in the level of development shown in **Table 4.0-1** below.

TABLE 4.0-1
ASSUMED BUILDOUT DENSITY AND INTENSITY – MASTER PLAN AREA

Land Use	Acres	Generation Rates			Buildout Assumptions		
		DU/acre	Emp./Acre	Avg. FAR	Units	Employees	Sq. Ft.
Medium-Density Residential	20.2	42	–	–	848	–	–
High-Density Residential	4.2	60	–	–	252	–	–
Ground-Floor Retail	1.3	–	500	0.8	–	650	45,302
Flex	2.9	42/60	224	1.6	68	650	101,059
Project Total					**1,168**	**1,300**	**146,362**

Once the overall buildout condition of the Master Plan was developed (above), the resulting generation of dwelling units, employees, and square feet of nonresidential development was split into each of the phases of development described in Section 3.0, Project Description. The resulting buildout for each phase of development of the Master Plan is shown in **Table 4.0-2** below.

TABLE 4.0-2
BUILDOUT BY PHASE – MASTER PLAN AREA

Land Use by Phase	Net Acres	Medium-Density Residential Units	High-Density Residential Units	Employees	Square Feet Nonresidential
Phase 1					
Medium-Density Residential	2.40	101	–	–	–
High-Density Residential	0.00	–	0	–	–
Ground-Floor Retail	0.80	–	–	400	27,878
Flex	0.28	4	2	63	9,757
Urban Plaza	1.1	–	–	–	–
Other	5.32	–	–	–	–
PHASE 1 TOTAL	**9.1**	**105**	**2**	**463**	**37,636**
Phase 2					
Medium-Density Residential	0.00	0	–	–	–
High-Density Residential	0.00	–	0	–	–
Retail	0.18	–	-	90	6,723
Flex	0.00	0	0	0	0
Parking Garage	1.50	–	–	–	–
Other	1.20	–	–	–	–
PHASE 2 TOTAL	**2.70**	**0**	**0**	**90**	**6723**

Land Use by Phase	Net Acres	Medium-Density Residential Units	High-Density Residential Units	Employees	Square Feet Nonresidential
Phase 3					
Medium-Density Residential	0.00	0	–	–	–
High-Density Residential	2.60	–	156	–	–
Retail	0.00	–	–	0	0
Flex	0.00	0	0	0	0
Other	2.20	–	–	–	–
PHASE 3 TOTAL	**4.80**	**0**	**156**	**0**	**0**
Phase 4					
Medium-Density Residential	0.00	0	–	–	–
High-Density Residential	0.00	–	0	–	–
Retail	0.32	–	–	160	11,151
Flex	1.95	31	15	437	67,954
Parking Garage	1.80	–	–	–	–
Other	0.70	–	–	–	–
PHASE 4 TOTAL	**4.45**	**31**	**15**	**597**	**79,105**
Phase 5					
Medium-Density Residential	0.00	0	–	–	–
High-Density Residential	1.60	–	96	–	–
Retail	0.00	–	–	0	0
Flex	0.67	11	5	150	23,348
Park	0.40	–	–	-	-
Other	1.63	–	–	–	–
PHASE 5 TOTAL	**4.30**	**11**	**101**	**150**	**23,348**
West Coast Home Builders (Any Time During Project Life)					
Medium-Density Residential	17.8	748	–	–	–
Detention Basin	1.80	–	–	–	–
Other	5.60	–	–	–	–
WCHB TOTAL	**25.20**	**748**	**0**	**0**	**0**

Notes: Because retail uses are expected to be constructed under flex uses, the retail acreage is not included in the total acres per phase.

The analysis presented in this DEIR assumes the development described above and in **Tables 4.0-1** and **4.0-2**. Accordingly, impacts described herein were developed using the above development densities and intensities.

OTHER PROJECTS IN THE VICINITY

Table 4.0-3 below includes the name, associated acreage, dwelling units (if applicable), and land use designations and zoning of large-scale proposed and approved projects in the vicinity of the Master Plan area.

TABLE 4.0-3
PROPOSED AND APPROVED PROJECTS WITHIN THE CUMULATIVE STUDY AREA

Name of Project	Project Type[1]	Acres	Units or Sq. Ft.[2]	Distance/Direction from Master Plan Area	Status
Alves Ranch	SFR	40.42	167	Adjacent – W	Approved
Alves Ranch (Apartments)	MFR	40.42	393	Adjacent – W	Approved
Bailey Estates	SFR	122	249	Adjacent – S	Approved
Vista del Mar	SFR	104	540	Adjacent – SW	Under Construction
Oak Hills Apartments Clubhouse Remodel3	MFR	17.2	2,562	Adjacent – SE	Approved
Lawlor Estates	SFR	10.8	50	0.3 mi. – SE	Under Construction
San Marco Gas Station & Convenience Store	COM	1.44	6,000	0.8 mi. – W	Pending
San Marco Development	MFR	141	1,526	0.84 mi. – W	Approved, part. Under Const.
San Marco	SFR	421	1,412	1.1 mi. – W	Under Construction
Bancroft Gardens II	SFR	5.79	28	1.3 mi. – E	Approved
Lara's Concrete	COM	5.0	4,800	1.84 mi. – W	Pending
Concord Community Reuse Plan	Multiple	5,100	12,000 DU 8.5 mil Sq. Ft.	2.0 mi. - SW	Pending (City of Concord)

Source: City of Pittsburg 2010b; City of Concord, 2011.
Notes: [1]SFR = Single-Family Residential, MFR = Multi-Family Residential, COM = Commercial
[2]Residential projects list the number of dwelling units. Commercial projects list the number of square feet of development.
[3]The Oak Hills Apartments Clubhouse Remodel is a remodeling project and does not increase the overall number of dwelling units in the vicinity of the Master Plan area. Those units were constructed prior to the City's development of the proposed Master Plan.

The City of Pittsburg currently lists over 100 projects either approved, pending, or under construction in the city limits. However, the majority of those projects were determined to be too distant from the Master Plan area to be considered as part of the cumulative setting. The 11 projects listed in **Table 4.0-3** above are considered to be close enough in proximity to the Master Plan area to affect the cumulative environment.

STRUCTURE OF THE ENVIRONMENTAL IMPACT ANALYSIS

Sections 4.1 through 4.13 of this DEIR contain a detailed description of current setting conditions (including any applicable regulatory setting), an evaluation of the direct and indirect environmental effects resulting from the implementation of the proposed project, identification of proposed Master Plan policies and action items that mitigate the environmental effect, additional feasible mitigation measures, and identification of whether significant environmental effects of the project would remain after application of proposed policies and action items and feasible mitigation measures. The individual technical sections of the DEIR include the following information.

Existing Setting

The subsection includes a description of the physical setting conditions associated with the technical area of discussion, consistent with State CEQA Guidelines Section 15125. As identified above, the existing setting is based on conditions as they existed when the NOP for the project was released in December 2010.

Regulatory Framework

This subsection consists of the identification of applicable federal, state, regional, and local plans, policies, laws, and regulations that apply to the technical area of discussion.

Impacts and Mitigation Measures

The Impacts and Mitigation Measures subsection identifies direct and indirect environmental effects associated with implementation of the proposed Master Plan and identifies measures that would serve to mitigate the environmental effects. Standards of significance are identified and used to determine whether identified environmental effects are considered significant and require the application of mitigation measures. Each environmental impact analysis is identified numerically (e.g., Impact 4.8.1 – Violate Water Quality Standards or Discharge Requirements) and is supported by substantial evidence included in the discussion.

Mitigation measures for the proposed Master Plan were developed through a thorough review of the environmental effects of the project by consultants with technical expertise as well as by environmental professionals. The mitigation measures identified consist of "performance standards" that identify clear requirements which would avoid or minimize significant environmental effects (the use of performance standard mitigation is allowed under State CEQA Guidelines Section 15126.4(a) and is supported by case law Sacramento Old City Association v. City Council of Sacramento [3d. Dist 1991] 229 Cal.App.3d 1011, 1028 [280 Cal.Rptr. 478]).

Cumulative Impact Analysis

Definition of Cumulative Setting

CEQA Guidelines Section 15130 requires that EIRs include an analysis of the cumulative impacts of a project when the project's effect is considered cumulatively considerable. In general, the cumulative setting conditions considered in this DEIR are based on:

City of Pittsburg General Plan – The City's General Plan guides local land use in the City of Pittsburg and provides a framework within which future development is expected to occur. The General Plan was analyzed for its guidance and requirements applicable to each section of this DEIR, and the assumptions contained within were incorporated into the cumulative analysis presented in the technical sections of this DEIR (Sections 4.1 through 4.13) as well as this section.

Large-Scale Development Projects – Sourced from the City's "Project Pipeline" as well as through coordination with the County of Contra Costa, a list of major development projects expected to occur within the vicinity of the proposed project was considered as part of the Cumulative Setting. See Section 4.0, Assumptions, for a listing of these projects and their expected buildout conditions.

Recent Environmental Documentation – For those projects which have been approved but have not yet built out, such as the Alves Ranch project, CEQA documents prepared and certified by the City and the County were used to anticipate future development on those sites. Likewise, the Pittsburg/Bay Point BART Station Area Specific Plan EIR, prepared by the County and City in conjunction with BART (SCH 1998022071), was analyzed as it is expected to guide future development in the portions of the Specific Plan that lie outside the City of Pittsburg. As the City has not adopted this Specific Plan nor incorporated the EIR, it was not considered to guide future development in those portions of the Specific Plan area that lie within the incorporated city boundary.

Effect of Regional Conditions – The cumulative setting considers background traffic volumes and patterns on regional and state highways (e.g., State Route [SR] 4), background air quality conditions, and other associated environmental conditions that occur within the region, both inside and outside the immediate vicinity of the Master Plan.

Consideration of Service Provider Planning – In the case of services and utilities, the planning of those agencies that provide the services/utilities was considered and applied to the assumptions of the cumulative setting. For example, future water supply planning by the Contra Costa Water District (CCWD) was utilized in determining cumulative water supply need and expected customer load.

Cumulative setting conditions also consider existing, proposed, approved, and reasonably foreseeable large-scale development projects in the project vicinity, as listed in **Table 4.0-3**. This list of projects is intended to describe large-scale development activities in the vicinity of the Master Plan (cumulative study area) and is not intended to be an all-inclusive list of projects in the city.

The cumulative setting varies for each environmental issue area, depending on the resources affected and any relevant boundaries. For example, some resources such as geology and soils have relatively site-specific impact potential, while other resource areas such as air quality are studied on a regional basis, covering the entire air basin within which a proposed project lies. Each technical section of the DEIR includes a description of the geographic extent of the applicable cumulative setting, based on the characteristics of the environmental issues under consideration as set forth in Section 15130(b) of the State CEQA Guidelines.

Consideration of Cumulative Impacts

Each technical section in the Draft EIR includes a description of the cumulative setting geographic extent based on the characteristics of the environmental issue under consideration (e.g., consideration of the San Francisco Bay Area Air Basin for cumulative air quality analysis) as set forth in Section 15130(b) of the State CEQA Guidelines. Each section also considers whether the project's contribution to anticipated significant environmental effects that would occur under cumulative setting conditions is cumulatively considerable (i.e., a significant effect).

Cumulatively considerable means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (CEQA Guidelines Section 15065(a)(3)). Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time (CEQA Guidelines Section 15355(b)). The determination of whether the project's impact on cumulative conditions is considerable is based on a number of factors, including consideration of applicable public agency standards, consultation with public agencies, and expert opinion. Section 5.0, Cumulative Impacts, provides a summary of the cumulative impacts associated with the proposed project. Cumulative impacts are based on the project's contribution to development compared with cumulative baseline conditions.

REFERENCES

Contra Costa County and City of Pittsburg. 2001. Pittsburg/Bay Point BART Station Area Specific Plan Environmental Impact Report (Recirculated). Prepared in conjunction with Bay Area Rapid Transit. SCH 98022071.

———. 2002, June. Pittsburg/Bay Point BART Station Area Specific Plan. Prepared in conjunction with Bay Area Rapid Transit.

City of Concord. 2011. Concord Community Reuse Project. http://www.concordreuseproject.org/ (accessed January 20, 2011).

City of Pittsburg. 2001. Pittsburg 2020: A Vision for the 21st Century. City of Pittsburg General Plan. Includes Amendments through July 2010.

———. 2010a. Municipal Code.

———. 2010b. Project Pipeline List. http://www.ci.pittsburg.ca.us/Modules/ShowDocument.aspx?documentid=3795 (accessed August 29, 2010).

4.1 LAND USE AND PLANNING

This section of the Draft Environmental Impact Report (Draft EIR or DEIR) describes the existing land uses of the proposed Pittsburg/Bay Point BART Master Plan, characterizes surrounding uses, summarizes current planning activities in the project area, and discusses the project in the context of the City of Pittsburg General Plan (2001) and Municipal Code (2009). The analysis focuses on land use compatibility and General Plan consistency and impacts associated with the implementation and operation of the project.

4.1.1 EXISTING SETTING

REGIONAL SETTING

The Master Plan area encompasses an approximately 50.6-acre area in the western part of the City of Pittsburg, immediately adjacent to the Bay Point community of Contra Costa County (see **Figures 3.0-1** and **3.0-2** of Section 3.0, Project Description). The project site is located immediately south of State Route (SR) 4, immediately north of West Leland Road, approximately 580 feet west of Bailey Road, and immediately east of the Alves Ranch project area.

PROJECT SITE

The Master Plan area is currently owned by two entities. The western half of the Master Plan area (approximate) is owned by West Coast Home Builders (WCHB), a local development company. The remainder of the site, approximately the eastern half of the project, is owned by Bay Area Rapid Transit (BART). The Master Plan area encompasses the whole of Assessor's Parcel Numbers (APN) 097-160-044, -45, and -049 as well as the majority of APN 097-160-041. The only portion of APN 097-160-041 that lies outside the Master Plan area is the northern 2.5 acres (approximate) containing the approach and exit ramps for the existing BART station. The approach and exit ramps are not a part of the project and would not be modified by the proposed Master Plan.

The Master Plan area has a Mixed Use General Plan land use designation and is located within the M (Mixed Use) District (see **Figure 3.0-5**). The WCHB site is currently vacant, containing native and non-native grasses, while the BART property contains parking, bus pick-up areas, a small retail structure, and other features for the use of commuters utilizing the Pittsburg/Bay Point BART Station, located immediately north of the Master Plan area in the center of SR 4. The site also contains a stormwater detention basin in the northwest corner of the BART property.

ADJACENT LAND USES

The Master Plan area is surrounded on three sides (north, west, and south) by existing urban development and on the west by approved urban development projects that have yet to be constructed (see **Figure 3.0-3**). SR 4 is located immediately north of the Master Plan area, with existing urban development to the north of SR 4. Situated in the middle of SR 4 is the existing BART station, including passenger loading and unloading areas and the train tracks. Residential uses within the Bay Point neighborhood of Contra Costa County are located immediately north of SR 4. The Oak Hills Shopping Center, an existing local shopping center comprising several buildings and surface parking along Bailey Road, lies immediately west of the Master Plan area. Bailey Road and more residential development are immediately west of the shopping center. West Leland Road is located immediately adjacent to the Master Plan area to the south, across which are single-family homes. West of the Master Plan area, immediately adjacent to the parcel owned by WCHB, is the Alves Ranch project, a planned development with residential and commercial uses approved by the City in 2009 but not yet constructed.

4.1.2 REGULATORY FRAMEWORK

REGIONAL

BART Station Area Development Implementation Policy

In June 2010, the BART Board authorized the General Manager or her designee to execute a Joint Exercise of Powers Agreement (JPA) with the City of Pittsburg for the Pittsburg Bay Point BART Station by and between BART, and the Redevelopment Agency of the City of Pittsburg. The enabling legislation for the San Francisco Bay Area Rapid Transit District grants BART the powers to purchase, lease, and sell real property necessary to construct and operate a regional rapid rail system. These powers include the right to enter into long-term leases (or sales) involving real property rights, both surface and air rights, and/or direct connections from privately owned developments to BART facilities. Station Area Development was established as a new program area within the district in 1980. The purpose of the present policy is to outline specific goals and objectives for the Station Area Development program, define program functions, and establish policies and procedures for carrying out the program.

The district's joint development policy, Resolution No. 2837, provides the general direction and intent of the Station Area Development program. The present set of policies supplements that resolution by providing specific guidelines for the district in conducting business with public and private sector entities involved in development projects on or near BART-owned properties.

The following general policies of the Station Area Development Implementation Policy govern the district's approach to joint development and value capture projects. Those policies of the Station Area Development Implementation Policy that apply to land use in the Master Plan area (BART property) are:

1. The District shall work cooperatively with local jurisdictions, redevelopment agencies, developers, and other public and private sector entities to promote land use policies which encourage intensive, high quality development on and surrounding station properties.

2. The District shall promote joint development projects which enhance use of the transit system and shall actively encourage direct connections to stations from surrounding developments in order to promote pedestrian access.

3. The District shall consider joint development opportunities in the acquisition of additional property, the location of new station sites, and the construction of station facilities.

The following policies govern the way in which the district coordinates the use of BART-owned properties with local and use authorities:

1. The District will negotiate with local jurisdictions regarding mutually desirable land uses and intensity of development on BART properties before marketing these properties for commercial development. These negotiations will, to the extent feasible, also address land uses on non-District owned properties surrounding the stations with the aim of encouraging land use patterns supportive of transit.

2. In the course of formulating development plans, Station Area Development staff will coordinate closely with other BART programs, departments and offices concerned with the long-term use of station properties in order to ensure protection and enhancement of transit objectives in the development of BART sites.

3. As a part of the Station Area Development planning process, a specific parking strategy for a given station will be established which is consistent with the parking expansion goals and financing approach outlined in the Access Implementation Program. This parking strategy will be based on the principle of establishing expansion parking goals on a line segment rather than strictly on a station by station basis in order to balance development and access objectives. Cost efficient parking design and management guidelines, approaches to maintaining future development options, and mechanisms for protecting spaces intended for BART patrons from non-patron use will also be included.

The above policies apply to BART's responsibilities and guide their coordination of development plans such as the proposed Master Plan. As the policies do not concern the actual formation of the plan or the behavior or practices of the lead agency or primary jurisdiction (in this case, the City of Pittsburg), an analysis of the consistency of the proposed Master Plan to these policies is not included here.

LOCAL

City of Pittsburg General Plan

The General Plan of the City of Pittsburg serves as the overriding policy document for land use in the City of Pittsburg. Those goals and policies of the General Plan that apply to land use and the proposed Master Plan are listed below. **Table 4.1-1** below provides a list of all applicable land use goals and policies and the proposed Master Plan's consistency with those goals and policies. While this DEIR analyzes the Master Plan's consistency with the General Plan pursuant to State CEQA Guidelines Section 15125(d), the Pittsburg City Council has the responsibility for ultimately determining the proposed Master Plan's consistency with the General Plan.

The Pittsburg General Plan includes 15 planning subareas, 11 of which are within the current incorporated boundary of the city. The Master Plan area is located in the Southwest Hills subarea, described in the General Plan as follows:

- Annexed by the City in 1990, this subarea presently consists primarily of undeveloped, rolling hills. However, the area is the site of the approved 640-acre San Marco residential development, which will include both low and high-density residential units. The Oak Hills, Alves Ranch, Vista del Mar and Bailey Estates residential subdivisions are also located within this subarea. Additionally, the southern hills subarea includes the Faria property, which is not yet annexed to the City but is located within the County ULL. Potential sites for low-density residential neighborhoods are located outside the County ULL and may be available for development after the Restricted Federal Easement is abandoned.

- Multi-family housing developments will be concentrated along the West Leland Road corridor. A mixed-use, community commercial center at the West Leland Road/San Marco Boulevard intersection will serve nearby neighborhoods, while business commercial parks will be developed along West Leland Road. A small portion of the

Pittsburg/Bay Point BART Station Area Specific Plan area also lies within this subarea. (City of Pittsburg 2001, p. 2-35)

The General Plan also includes specific land use policies for each planning subarea. Those policies identified for the Southwest Hills subarea and that apply to land use for the proposed Master Plan are also identified in **Table 4.1-1**.

TABLE 4.1-1
PROJECT CONSISTENCY WITH APPLICABLE GENERAL PLAN LAND USE POLICIES

General Plan Policies	Consistent with General Plan	Analysis
Citywide Goals and Policies		
Goal 2-G-1 – Maintain a compact urban form within the City's projected municipal boundary. Ensure that hillside lands not environmentally suitable for development are maintained as open space.	Yes	The Master Plan calls for compact, urban development within the municipal boundary. The Master Plan area is not located in a hillside area.
Goal 2-G-2 – Promote large-scale office/business development, and reserve sites for Business Commercial uses in designated locations accessible from regional transportation systems.	Yes	The land use designations of the Master Plan call for both street-level retail and flex uses, which will contain a mix of business commercial uses in conjunction with residential and quasi-business uses. The Master Plan area is located immediately adjacent to the Pittsburg/Bay Point BART Station and will include a large number of transit facilities (bus shelters, bus-only lanes, etc.).
Goal 2-G-3 – Emphasize concentrated commercial development, rather than linear commercial strips.	Yes	The Master Plan calls for concentrated development rather than linear commercial development.
Goal 2-G-4 – Provide a range of development intensities, with the highest intensities in Downtown and in areas accessible to transit and services, and lower intensities in hillsides and at the City's southern edge.	Yes	The Master Plan includes higher development intensities than the surrounding neighborhood. However, it is co-located with transit and services, ensuring consistency with this goal.
Goal 2-G-5 – Promote a diversity of housing types, including opportunities for hillside estate development, as well as smaller lot, infill, and high-density housing.	Yes	The Master Plan promotes a range of housing types, including medium- and high-density residential uses, which could accommodate small lot single family, duet, townhouse, and condominium type development. As the Master Plan area is substantially surrounded by single-family homes, existing development also provides for diversity in the area, ensuring consistency with this goal.
Goal 2-G-7 – Promote flexibility and diversity in land use arrangements, including mixed-use development in appropriate areas.	Yes	The Master Plan provides for mixed-use development in an area designated in the General Plan for such development, ensuring consistency with this goal.
Policy 2-P-10 – Reserve sites for Business Commercial uses, including but not limited to: • Along State Route 4, focused at the Willow	Yes	The Master Plan includes business and commercial uses and is located adjacent to the Pittsburg/Bay Point BART Station. Therefore,

General Plan Policies	Consistent with General Plan	Analysis
Pass Road/San Marco Boulevard interchange and Loveridge Road interchange; • Adjacent to the Pittsburg/Bay Point BART Station; • Between Willow Pass Road and the BNSF Railroad tracks, west of Downtown; and • Along Harbor Street, between State Route 4 and East Leland Road (the proposed Railroad Avenue BART Station).		the Master Plan is consistent with this policy.
Policy 2-P-13 – Ensure that buffers—including landscaping, berms, parking areas, and storage facilities—are used to separate potentially incompatible activities.	Yes	The Master Plan includes landscaped corridors between the more dense development on the BART site and the medium-density development on the WCHB site.
Policy 2-P-15 – Ensure minimum residential densities, in accordance with the ranges stipulated in this Plan.	Yes	The density of residential development in the Master Plan area was established by the General Plan to be no more than 65 dwelling units per acre, though a provision was included to allow a different density with the approval of a Specific Plan. As a more precise, focused plan for the area, the proposed Master Plan is congruent with a Specific Plan. As such, the Master Plan can establish density requirements for the site, allowing for consistency with this policy. Overall, the density across the entire Master Plan site would not exceed the maximum 65 units per acre covered by the General Plan.
Southwest Hills Subarea Policies		
Policy 2-P-85 – Work with project developers to ensure that new residential neighborhoods and business commercial complexes built along West Leland Road provide transit amenities (such as pedestrian paths, bus shelters, bicycle racks) and convenient access to the Pittsburg/Bay Point BART Station.	Yes	The internal circulation for both vehicles and pedestrians/bicyclists was designed in order to provide connectivity through the Master Plan area to the Pittsburg/Bay Point BART Station, ensuring consistency with this policy.
Policy 2-P-86 – Ensure that all proposed residential development is set back from the edge of State Route 4 to mitigate visual and noise impacts.	Undetermined	The exact placement of structures on the project site has not been determined, thus consistency with this policy cannot be determined until specific development proposals are submitted to the City for future development in the Master Plan Area.
Policy 2-P-92 – Pursue construction of a landscaped multi-use path along West Leland Road, from Pittsburg/Bay Point BART Station to the proposed San Marco Village. Ensure that design of the linear parkway accommodates bicyclists.	Yes	The Master Plan includes dedicated pedestrian/bicycle pathways along the north side of West Leland Road, consistent with this policy.
Policy P-1.1.E - Encourage residential and mixed use development within the Urban Limit Line to meet regional fair share housing goals by	Yes	The proposed Master Plan area is located within a FOCUS PDA, and the proposed land use plan contains a mix of medium and high

General Plan Policies	Consistent with General Plan	Analysis
focusing residential and mixed use development on sites that have been designated within Priority Development Areas (PDAs) under the MTC/ABAG FOCUS Program.		density residential land uses that would allow for development of residential units to meet the City's fair share housing goals
Policy P-1.4A - Support the development of a master plan for the Pittsburg/Bay Point BART Station area that includes a high-density housing component and high intensity commercial development to increase the jobs/housing balance near the BART Station. Consult with property owners, for profit and non-profit developers throughout the planning process to create flexible development standards to support financially feasible projects. Offer an incentive package for projects that provide a long-term affordable housing component. Incentives could include fast-tracking, fee waiver, reduced parking requirements and other incentives.	Yes	The proposed project is a Master Plan containing a mix of residential and commercial uses in close proximity to the existing BART Station. Property owners and the public were consulted through the planning process, and flexible development standards and uses were incorporated into the plan to allow for the highest and best future use of the property. All development in the City is, and will continue to be, eligible for incentives and concessions such as those described in the Housing Element. Project-specific incentives will be considered on an individual project basis.
Policy P-1.4B - Support reduced parking requirements below 1.5 parking spaces per unit for affordable and senior housing projects located within one-half mile of BART and other transit facilities.	Yes	The proposed Master Plan sets senior parking rates at a maximum of 0.5 parking spaces per unit. There is not a parking minimum for other residential uses on the site.
Policy P-1.4E – Ensure that portions of the Pittsburg/Bay Point BART Master Plan project are developed at a minimum density of 40 units per acre and allow up to 65 units per acre. Ensure that the plan contains financial and development incentives.	Yes	Approximately four acres of the approximately 50-acre site is designated High Density Residential with a maximum of 70 units per acre.
Policy P-1.4F – Ensure that the Pittsburg/Bay Point Master Plan contains financial and development incentives including but not limited to those listed in Policy P-2.1 (including but not limited to streamlines review process, fee waivers and deferrals, utility fee credits, priority application processing, incentives under State Density Bonus Law). Encourage owners of very large parcels (over 20 acres in size) to partner with non-profit developers to develop a portion of the site with housing affordable to low and moderate-income households.	Yes	All development in the City is, and will continue to be, eligible for incentives and concessions such as those described in the Housing Element. Project-specific incentives will be considered on an individual project basis.

General Plan Land Use Designation

The City of Pittsburg land use designation for the Master Plan area is Mixed Use. The General Plan describes the Mixed Use land use designation as follows:

> *Mixed Use*. Applies to approximately 50 acres located west of the Oak Hills Shopping Center, and includes the Pittsburg/Bay Point BART Station parking lot. Residential densities up to 65 units per gross acre, or as approved by the

Pittsburg/Bay Point BART Station Area Specific Plan, are allowed on these properties. Maximum FAR for non-residential development is 1.0, or as approved by the Specific Plan. (City of Pittsburg 2001, p. 2-18)

Zoning

According to the Pittsburg Municipal Code, the Master Plan area lies within the M (Mixed Use) District. According to the Municipal Code, the purpose of the M District is:

A. Promote use of mass transit facilities by placing high concentrations of residents and employees in proximity to transit stations and routes;

B. Establish standards and guidelines that allow integration of high-density residential, commercial and business uses, resident and employee services, and public spaces;

C. Provide safe, attractive, accessible, and well-designed pedestrian and bicycle pathways and routes between transit facilities, services, jobs and housing, in order to create interconnected neighborhoods and reduce automobile use;

D. Minimize prominence of the automobile and enhance the pedestrian space through design standards that encourage visible and usable public open spaces and that orient commercial structures toward the pedestrian and street;

E. Ensure that new development, redevelopment, rehabilitation of structures and establishment of new uses within one-half mile of existing and future transit stations occur in a manner that is consistent with the General Plan.

4.1.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The impact analysis provided below is based on the following State CEQA Guidelines Appendix G. An impact is considered significant if the project would:

1) Physically divide an established community.

2) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

3) Conflict with any applicable habitat conservation or natural community conservation plan.

According to the Initial Study for the proposed Master Plan, released by the City concurrently with the Notice of Preparation on December 7, 2010, less than significant impacts related to division of an established community were expected because the Master Plan area is surrounded by development of a similar type and style and because the Master Plan does not include provision of any features that would serve to prevent normal circulation around and through the Master Plan area. Pursuant to State CEQA Guidelines Section 15128, no additional documentation of this impact is required in the EIR, nor is one included here.

Furthermore, the Initial Study found a potentially significant impact in regard to conflicts with the East Contra Costa County Habitat Conservation Plan/Natural Community Conservation Plan. However, this issue is addressed in Section 4.9, Biological and Natural Resources, of this DEIR. Therefore, possible conflicts with the adopted Habitat Conservation Plan/Natural Community Conservation Plan are not discussed in this section.

Methodology

Evaluation of potential land use impacts of the proposed Master Plan was based on review of relevant planning documents, including the Pittsburg General Plan, the Pittsburg Municipal Code, and field review of the project site and surrounding area. The focus of the land use analysis is on land use impacts that would result from implementation of the proposed Master Plan. Land use conflicts are identified and evaluated based on existing land uses, land uses proposed as part of the project, land use designations, and standards and policies related to land use. Land use compatibility is based on the intensity and patterns of land use to determine whether the project would result in incompatible uses or nuisance impacts to sensitive receptors (such as residences, medical facilities, and schools).

Potential land use conflicts or incompatibility (specifically during construction activities) are usually the result of other environmental effects, such as generation of noise or air quality issues resulting from grading activities. Operational land use impacts of the project are evaluated in this section. The reader is referred to Sections 4.2 through 4.13 for detailed analysis of other environmental impacts, including noise, traffic, air quality, and biological and natural resources, that would result from the proposed project's construction and operation.

PROJECT IMPACTS AND MITIGATION MEASURES

Consistency with Local Plans and Policies

Impact 4.1.1 The proposed Master Plan is consistent with Pittsburg General Plan policies and the requirements of the Zoning Code. This impact is considered **less than significant**.

The proposed land use plan and other appurtenant features of the Master Plan are described in Section 3.0, Project Description, of this DEIR. The land use designations and other land uses described by the Master Plan and the net acreage of each feature are shown in **Table 4.0-1** in Section 4.0, Assumptions.

General Plan Land Use Designation

According to the General Plan, the Master Plan area is anticipated to be developed at densities up to 65 dwelling units per acre, or higher if allowed by the Pittsburg/Bay Point BART Station Area Specific Plan. Under the General Plan, density is typically calculated according to gross acreage. Therefore, at full build-out under the General Plan, the Master Plan area could result in the development of approximately 3.200 residential units. At a non-residential FAR of 1.0, a total of 2.2 million square feet of commercial uses could be accommodated on the site.

However, the proposed project contains a more focused land use plan based on public and property owner input and contains variations in residential densities as well as the strategic placement of public plazas, parking garages and commercial uses. In addition, because it is a more precise plan with an integral multi-modal roadway network designed to support pedestrian and bicycle movement through the site, the proposed land use plan nets out the land devoted to roadways, and multi-modal transportation area (a total of 16.7 acres or 33% of the project area).

According to the buildout assumptions developed for the Master Plan (see Section 4.0, Assumptions, of this DEIR), proposed land uses are expected to result in development of approximately 1,168 dwelling units and 146,362 square feet of nonresidential uses employing 1,300 persons. Considering the number of net developable acres on-site (33.9) and the number of projected dwelling units (1,168), the proposed Master Plan would result in a density of approximately 34.5 units per net acre. As such, these densities are within the allowable density set forth in the General Plan.

Similarly, assumed development at buildout (see Section 4.0, Assumptions) would result in the development of 146,362 square feet of nonresidential development. When the total acres on the site are considered, this would result in a FAR of 0.07. However, since the WCHB site will not include any nonresidential uses, the FAR could be calculated using the total acres on the BART property alone, which would result in a FAR of 0.12. In either case, the FAR at buildout is less than the 1.0 allowed for in the General Plan.

Zoning

According to Pittsburg Municipal Code (PMC) section, 18.53.030(A), land use and development regulations for M District properties shall conform to applicable use and development regulations set forth in a specific plan prepared for the area. Therefore, analysis of the proposed Master Plan's consistency with specific zoning regulations or development standards of the City is not possible with the information currently available. Future development proposals within the Master Plan area will be analyzed by City staff for consistency with the requirements of the proposed Master Plan prior to consideration by the City Council.

Physical Effects of Development

Development and operation of the Master Plan is expected to result in a range of environmental impacts, typical of urban development. For each of the technical sections included in this DEIR (Sections 4.1 through 4.13), the predicted environmental effects are discussed and determined. Also included in those sections is the proposed Master Plan's consistency with General Plan goals and policies applicable to each discipline.

According to the findings of this section and other technical sections of this DEIR, the proposed Master Plan will comply with the goals and policies of the General Plan. Likewise, as described above, the Master Plan complies with all General Plan goals and policies related to the project area.

As a more focused plan for the project area, the proposed Master Plan would act in line with and as an extension of the General Plan and zoning regulations for the Master Plan Area. The General Plan assumed a Specific Plan for the area, roughly analogous in effect and intent to the proposed Master Plan. Furthermore, the Master Plan has been written in consideration of an in order to further the goals and intent of the General Plan while providing guidance as to the nature, character, and intensity of development in the Master Plan Area over a 20-year period. Considering this, the proposed Master Plan is expected to have a **less than significant** impact in regard to consistency with local plans and policies.

Mitigation Measures

None required.

4.1.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The cumulative setting for land use impacts is the City of Pittsburg and the nearby community of Bay Point. Cumulative development includes buildout of the Pittsburg General Plan and buildout consistent with the Pittsburg/Bay Point BART Station Area Specific Plan, as well as any existing, approved, proposed, and reasonably foreseeable development within the cumulative study area, as described in Section 4.0, Assumptions, of this DEIR. The cumulative impact analysis herein focuses on the proposed project's contribution to cumulative land use impacts and whether that contribution is considered considerable.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Land Use Compatibility Impacts

Impact 4.1.2 Implementation of the proposed project, in combination with existing, approved, proposed, and reasonably foreseeable development, would result in development that would change existing land uses patterns and intensity. As this change was anticipated in the General Plan, this impact is considered **less than cumulatively considerable.**

Continued development in the cumulative setting would result in increased urbanization, including the density of residential, commercial, office, recreational, and public uses. In general, land use impacts would be related to noise, traffic, air quality, and hazards issues, which are discussed in the relevant sections of this DEIR. Land use conflicts are generally site-specific and would not result in a cumulative impact. The cumulative environmental effects of development of the project site and surrounding area are addressed in the technical sections of this DEIR (Sections 4.1 through 4.13). It is important to note that the Pittsburg General Plan anticipates development of the Master Plan area in a manner and at a higher density than that proposed in the Master Plan. Furthermore, development of this site to a similar intensity proposed by the Master Plan was anticipated by Contra Costa County, as evidenced by the Pittsburg/Bay Point BART Station Area Specific Plan and EIR.

As the land use impacts of Master Plan development are site-specific and limited to the policies and goals of the Pittsburg General Plan, as the proposed Master Plan has been found to be consistent with the General Plan, and as adjacent jurisdictions anticipated and planned for development of the scale and scope of the Master Plan, the proposed project is not anticipated to contribute significantly to cumulative land use impacts and the impact is considered **less than cumulatively considerable**.

Mitigation Measures

None required.

REFERENCES

Contra Costa County and City of Pittsburg. 2001. Pittsburg/Bay Point BART Station Area Specific Plan Environmental Impact Report (Recirculated). Prepared in conjunction with Bay Area Rapid Transit. SCH 98022071.

———. 2002, June. Pittsburg/Bay Point BART Station Area Specific Plan. Prepared in conjunction with Bay Area Rapid Transit.

———. 2008. BART Station Area Development Implementation Policy. http://www.bart.gov/about/planning/strategic.aspx.

City of Pittsburg. 2001. Pittsburg 2020: A Vision for the 21st Century. City of Pittsburg General Plan. Includes Amendments through July 2010.

———. 2009. Municipal Code.

4.2 Population, Housing, and Employment

This section discusses the population, housing, and employment impacts of the proposed project on current and projected future conditions. This section also presents information regarding the proposed project's relationship to adopted programs and plans.

4.2.1 EXISTING SETTING

DEMOGRAPHICS

The Master Plan area is located in the eastern third of the City of Pittsburg. Immediately adjacent to the Master Plan area, across State Route (SR) 4, is the community of Bay Point, an unincorporated community in Contra Costa County. In order to provide the data below regarding the City of Pittsburg and the community of Bay Point, data from the U.S. Census Bureau was compiled by ESRI, a data warehousing company. Historic data from the 1990 and 2000 decennial censuses was utilized as well as projections provided by ESRI for both 2010 and 2015.[1] Projections are produced by ESRI by utilizing statistical methods in consideration of ancillary sources, including the U.S. Postal Service and other publicly available sources.

Data for the City of Pittsburg includes all residents whose primary residence is located inside the incorporated boundary of the city. Data for Bay Point represents all residents who live in the boundaries of the Census Designated Place (CDP) known as the Bay Point CDP. Because the boundaries of the Bay Point CDP may not correspond to the boundaries of the Bay Point community, as delineated by Contra Costa County, or the Bay Point planning subarea delineated by the City of Pittsburg General Plan, there may be some variation between the data presented here and those data previously reported by other agencies and jurisdictions. However, as the methodology in retrieving the data presented is consistent between the City of Pittsburg and Bay Point, the conclusions presented herein remain valid.

Population Trends

Table 4.2-1 below includes the total population for both the City of Pittsburg and the Bay Point CDP.

TABLE 4.2-1
PITTSBURG/BAY POINT TOTAL POPULATION (COUNT AND PERCENTAGE CHANGE BY YEAR)

Year	Pittsburg		Bay Point		TOTAL	
	Population	% Change	Population	% Change	Population	% Change
1990	48,276	n/a	17,111	n/a	65,387	n/a
2000	56,769	17.6%	21,534	25.8%	78,303	19.8%
2010	63,926	12.6%	22,645	5.2%	86,571	10.6%
2015	66,216	3.6%	22,855	0.9%	89,071	2.9%

Source: U.S. Census Bureau 1990, 2000; ESRI 2010.
Notes: Projections for 2015 provided by ESRI. Bay Point represents the Bay Point Census Designated Place.

[1] The results of the 2010 decennial census were not available at the time this DEIR was prepared. Thus, the 2010 data provided in this section is a projection of known data from 2000, 2006, and other available dates provided by the U.S. Census Bureau.

Both the City of Pittsburg and the Bay Point CDP have experienced significant population growth in the past, with the greatest growth occurring between 1990 and 2000. While growth spiked sharply in the Bay Point CDP between 1990 and 2000 and then sharply declined, the City of Pittsburg saw increased growth through 2010. Projections show growth tapering off through 2015.

The age distribution of the City of Pittsburg for all four study years is shown in **Table 4.2-2** below.

TABLE 4.2-2
PITTSBURG POPULATION BY AGE (PROPORTION BY YEAR)

Age	Proportion of Total Population			
	1990	2000	2010	2015
0–4	10.3%	8.3%	8.7%	8.6%
5–9	9.3%	8.9%	8.3%	8.4%
10–14	7.4%	8.6%	7.5%	7.8%
15–19	6.8%	8.0%	7.5%	6.8%
20–24	7.9%	7.3%	7.4%	7.2%
25–34	20.8%	14.9%	15.7%	15.5%
35–44	15.5%	16.3%	13.5%	13.8%
45–54	8.2%	12.5%	13.2%	11.8%
55–64	5.9%	6.8%	9.3%	9.9%
65–74	4.8%	4.5%	4.9%	5.9%
75–84	2.5%	2.7%	2.8%	2.9%
85+	0.6%	1.0%	1.3%	1.3%
18+	68.9%	69.2%	70.9%	71.1%

Source: U.S. Census Bureau 1990, 2000; ESRI 2010.
Notes: Projections for 2015 provided by ESRI. Proportions may not add up to 100 percent due to rounding.

Since 1990, the median age of residents in the City of Pittsburg has increased slightly. In 1990, the largest proportion of residents was between 25 and 34 years old. While that age group is expected to remain dominant through 2015, the proportion of residents in age groups between 25 and 64 has increased substantially, indicating a population that is steadily growing older over time. This indication is correlated by the fact that the number of residents aged 18 years and older has increased slightly over time.

Employment Trends

The proportion of employed persons and unemployed persons in the City of Pittsburg is shown in **Table 4.2-3**. The percentages shown in the table below do not include those outside the labor force, those too young, or those that have declared on their Census form that they are not seeking employment. Also not included are members of the armed forces.

TABLE 4.2-3
PITTSBURG POPULATION BY EMPLOYMENT STATUS (PROPORTION BY YEAR)

Employment Status	Proportion of Total Population in Labor Force			
	1990	2000	2010	2015
Employed	92.7%	92.6%	83.9%	86.5%
Unemployed	7.3%	7.4%	16.1%	13.5%

Source: U.S. Census Bureau 1990, 2000; ESRI 2010.
Notes: Table does not include those too young to work, those not seeking employment, or those employed by the armed forces. Projections for 2015 provided by ESRI. Proportions may not add up to 100 percent due to rounding.

The City of Pittsburg has seen a sharp increase in unemployed persons, with the greatest increase occurring between 2000 and 2010. This increase is commensurate with the current national and state economic climate. According to ESRI forecasts, this situation is expected to ease somewhat through 2015.

Household Income

The total number of households in both the City of Pittsburg and the Bay Point CDP are shown in **Table 4.2-4**. Also listed is the total for both, with the percentage change between each time period.

TABLE 4.2-4
PITTSBURG/BAY POINT TOTAL HOUSEHOLDS (COUNT AND PERCENTAGE CHANGE BY YEAR)

Year	Pittsburg		Bay Point		TOTAL	
	Households	% Change	Households	% Change	Households	% Change
1990	15,852	n/a	5,857	n/a	21,709	n/a
2000	17,741	11.9%	6,525	11.4%	24,266	11.8%
2010	19,785	11.5%	6,689	2.5%	26,474	9.1%
2015	20,462	3.4%	6,722	0.5%	27,184	2.7%

Source: U.S. Census Bureau 1990, 2000; ESRI 2010.
Notes: Projections for 2015 provided by ESRI. Bay Point represents the Bay Point Census Designated Place.

As with total population (see **Table 4.2-1**), both the City of Pittsburg and the Bay Point CDP have experienced increases in the total number of households, with somewhat greater increases seen in Pittsburg. Household growth in Bay Point is expected to flatten out through 2015, but household growth in the City of Pittsburg is expected to occur at greater than 3 percent through the same time period.

The proportion of household incomes in the City of Pittsburg is shown in **Table 4.2-5**. Also listed is the average income for each of the four study years. Incomes presented in the table are not adjusted for inflation.

TABLE 4.2-5
PITTSBURG HOUSEHOLDS BY INCOME (PROPORTION AND AVERAGE BY YEAR)

Income Range	Proportion of Total Households			
	1990	2000	2010	2015
<$15,000	17.6%	11.6%	9.2%	6.9%
$15,000 – $24,999	12.9%	10.0%	7.5%	5.9%
$25,000 – $34,999	15.8%	10.8%	7.6%	5.6%
$35,000 – $49,999	23.2%	17.0%	14.4%	11.6%
$50,000 – $74,999	22.0%	22.8%	19.7%	20.8%
$75,000 – $99,999	6.3%	15.2%	15.8%	16.8%
$100,000 – $149,999	1.6%	10.2%	20.2%	24.8%
$150,000+	0.6%	2.4%	5.6%	7.6%
Average Income	$40,676	$58,091	$73,775	$83,031

Source: U.S. Census Bureau 1990, 2000; ESRI 2010.
Notes: Table is not adjusted for inflation. Projections for 2015 provided by ESRI. Proportions may not add up to 100 percent due to rounding.

According to the data presented above, the proportion of households reporting incomes less than $50,000 has decreased and is expected to continue to decrease through 2015. Conversely, incomes over $50,000 have increased, correlating with an attendant increase in average income. Increases are tempered by the fact that the above data does not adjust for inflation. However, average income is expected to be $83,031 in 2015, more than twice that reported in 1990, indicating a moderate increase in average income in the city since that year.

Housing Stock

The total number of housing units in both the City of Pittsburg and the Bay Point CDP, as well as the total housing units in both locations combined, are shown in **Table 4.2-6**.

TABLE 4.2-6
PITTSBURG/BAY POINT TOTAL HOUSING UNITS (COUNT AND PERCENTAGE CHANGE BY YEAR)

Year	Pittsburg		Bay Point		TOTAL	
	Housing Units	% Change	Housing Units	% Change	Housing Units	% Change
1990	16,857	n/a	6,177	n/a	23,034	n/a
2000	18,300	8.6%	6,716	8.7%	25,016	8.6%
2010	21,060	15.1%	7,044	4.9%	28,104	12.3%
2015	22,229	5.6%	7,205	2.3%	29,434	4.7%

Source: U.S. Census Bureau 1990, 2000; ESRI 2010.
Notes: Projections for 2015 provided by ESRI. Bay Point represents the Bay Point Census Designated Place.

The number of housing units in both the City of Pittsburg and the Bay Point CDP has increased over time, with the greatest increase seen inside the city. Consistent with the current national and state economic climate, growth in housing units is expected to taper off through 2015.

The tenure of housing units, both occupancy status and type of occupancy, for the City of Pittsburg is shown in **Table 4.2-7** below.

TABLE 4.2-7
PITTSBURG HOUSING UNITS BY TENURE (PROPORTION BY YEAR)

Housing by Tenure	Proportion of Total Housing Units			
	1990	2000	2010	2015
Occupied	93.6%	96.9%	93.9%	92.1%
Owner-Occupied	56.9%	60.9%	55.4%	54.1%
Renter-Occupied	36.7%	36.0%	38.5%	38.0%
Vacant	6.4%	3.1%	6.1%	7.9%

Source: U.S. Census Bureau 1990, 2000; ESRI 2010.
Notes: Projections for 2015 provided by ESRI. Proportions may not add up to 100 percent due to rounding.

The number of vacant homes in the City of Pittsburg decreased by more than half between 1990 and 2000. However, vacancies have risen sharply since then and are expected to increase somewhat through 2015. While the proportion of renter-occupied homes has increased slightly as compared to owner-occupied housing units, the ratio of owner-occupied units to rented units has not changed appreciably over time.

Average household size in both the City of Pittsburg and the Bay Point CDP is shown in **Table 4.2-8**. Also included is a combined number, generated by calculating an average of the Pittsburg and Bay Point figures. An average of an average can result in statistical error when the sample size is small. However, it is appropriate in this case because the smallest sample size used was greater than 6,000.

TABLE 4.2-8
PITTSBURG AND BAY POINT AVERAGE HOUSEHOLD SIZE (PERSONS PER HOUSEHOLD BY YEAR)

Year	Average Household Size (Persons)		
	Pittsburg	Bay Point	Combined
1990	3.02	2.91	2.97
2000	3.17	3.27	3.22
2010	3.20	3.36	3.28
2015	3.21	3.38	3.30

Source: U.S. Census Bureau 1990, 2000; ESRI 2010.
Notes: Projections for 2015 provided by ESRI. Bay Point represents the Bay Point Census Designated Place (CDP). Combined figure represents an average of the two figures presented for the City of Pittsburg and Bay Point CDP. Given the high sample size (over 5,000 households in a given year/location), this is a statistically acceptable approximation of actual average.

Both the City of Pittsburg and the Bay Point CDP had an increase in average household size between 1990 and 2000. However, since 2000 the average has not changed an appreciable amount, nor is the average household size expected to increase significantly through 2015.

4.2.2 REGULATORY FRAMEWORK

PITTSBURG GENERAL PLAN

The General Plan serves as the overriding policy document for land use in the City of Pittsburg. **Table 4.2-9** provides a list of all applicable growth management and housing policies and the proposed Master Plan's consistency with those goals and policies. While this DEIR analyzes the Master Plan's consistency with the General Plan pursuant to State CEQA Guidelines Section 15125(d), the Pittsburg City Council has the responsibility for ultimately determining the Master Plan's consistency with the General Plan. See Section 4.1, Land Use, for additional policies which may apply to housing and population within the City.

TABLE 4.2-9
PROJECT CONSISTENCY WITH APPLICABLE GENERAL PLAN GROWTH MANAGEMENT AND HOUSING POLICIES

General Plan Policies	Consistent with General Plan	Analysis
Growth Management Element Goals and Policies		
Goal 3-G-1 – Manage the City's growth to balance development of housing options and job opportunities, protection of open space and habitat areas, construction of transportation improvements, and preservation of high quality public facilities.	Yes	The proposed Master Plan includes a range of job opportunities, transportation improvements, and allowance for public facilities. Likewise, the Master Plan allows for development of a range of housing types, including typical multi-family housing as well as portions expected to be developed for senior housing. Therefore, the Master Plan is consistent with this goal.
Policy 3-P-1 – Allow urban development only in areas where public facilities and infrastructure (police, fire, parks, water, sewer, storm drainage, and community facilities) are available or can be provided.	Yes	See the associated technical sections of this DEIR for a discussion of the required provision of such services and utilities. The Master Plan area is located in an area surrounded by existing urban development and other areas approved for development and under construction. As such, these services and utilities are available in the vicinity of the Master Plan area, ensuring consistency with this policy.
Policy 3-P-2 – Prior to project approval, ensure that the existing and planned transportation system will have adequate capacity to accommodate new urban development.	Yes	See Section 4.2, Transportation and Traffic, of this DEIR for the proposed Master Plan's effect on the local transportation system. The capacity of the existing and future transportation system was analyzed and mitigation was included in Section 4.2 to reduce the effect of the proposed Master Plan to the greatest extent feasible.
Housing Element Goals and Policies		
Goal 13-G-1 – Foster development of a variety of housing types, densities and prices to balance the City's housing stock and meet the City's regional fair share housing needs for people of all income levels.	Yes	The proposed Master Plan will provide for development of higher-density residential uses in an area of the city largely dominated by single-family homes. This will provide additional housing opportunities for people who cannot afford or do not seek single-family housing. Therefore, the Master Plan is consistent with this goal.

General Plan Policies	Consistent with General Plan	Analysis
Goal 13-G-2 - Promote the expansion of our affordable housing stock, including that which accommodates special needs households.	Yes	The proposed Master Plan would add approximately 1,168 dwelling units to the city, a portion of which would be affordable to low and moderate income households pursuant to Pittsburg Municipal Code (PMC) section 18.86, Inclusionary Housing.
Goal 13-G-5 – Enhance the visual quality of Pittsburg's residential neighborhoods.	Yes	The proposed Master Plan includes design guidelines formulated to ensure that development in the Master Plan area is of good visual quality, resulting in consistency with this goal.
Policy 13-P-1.1 – Ensure there is an adequate supply of mixed use and residentially zoned land of appropriate densities to accommodate existing and anticipated housing needs through 2020.	Yes	The proposed Master Plan concerns an area of the city designated for mixed uses, resulting in consistency with this policy.
Policy 13-P-1.4 – Support the construction of multi-family housing in close proximity to transit, arterials, shopping, and public services.	Yes	The proposed Master Plan includes multi-family dwelling units immediately adjacent to the existing BART station. Furthermore, the Master Plan calls for update of the existing bus pick-up areas in the Master Plan area, ensuring consistency with this policy.
Policy 13-P-1.8 – Meet the City's fair share regional housing needs.	Yes	The proposed Master Plan would be expected to result in development of 1,168 dwelling units, expanding the housing inventory of the city and helping to ensure consistency with this policy. In addition, a portion of this housing would be affordable to low and moderate income households pursuant to PMC section 18.86, Inclusionary Housing.
Policy 13-P-2.2 – Accommodate the development of housing that is accessible to disabled persons and facilitates aging in place.	Yes	The proposed Master Plan would provide significant numbers of medium- and high-density residential units as well as a mix of uses on-site that will allow those with mobility challenges and seniors to live in the Master Plan area in close proximity to services and transit. Therefore, the Master Plan is consistent with this policy.
Policy 13-P-2.5 – Increase the supply of rental housing available and affordable to extremely low, very low, low, and moderate income households, and in particular large families.	Cannot Be Determined at This Time	The proposed Master Plan does not include specific details as to any one building's design or content. In addition, the actual date of construction is unknown. As the design of the structures as well as market forces acting upon a given project cannot be determined, the price/rental cost of any unit in the Master Plan area also cannot be determined; however, a portion of this housing would be affordable to low and moderate income households pursuant to PMC section 18.86, Inclusionary Housing. Consistency with Inclusionary Housing requirements will be addressed as specific development proposals are brought to the City.

General Plan Policies	Consistent with General Plan	Analysis
Policy 13-P-5.1 – Utilize smart growth principles in the site planning of new subdivisions to enhance the quality of life of Pittsburg residents.	Yes	The land use designations and overall design of the Master Plan area were developed using smart growth principles, ensuring consistency with this policy.

4.2.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The impact analysis provided below is based on the following State CEQA Guidelines Appendix G thresholds of significance:

1) Induce substantial population growth in an area, either directly or indirectly.
2) Displace substantial numbers of existing housing necessitating the construction or replacement housing elsewhere.
3) Displace substantial numbers of people necessitating the construction of replacement housing elsewhere.

According to the Initial Study for the proposed Master Plan, released by the City concurrently with the Notice of Preparation on December 7, 2010, less than significant impacts related to displacement of housing or people. There are currently no residences located in the Master Plan area. Therefore, no impact would occur. Pursuant to State CEQA Guidelines Section 15128, no additional documentation of this impact is required in the EIR, nor is one included here.

METHODOLOGY

Section 4.0 describes the number of dwelling units, square feet of non-residential uses, and employees expected to be located in the Master Plan Area at buildout of the Master Plan. In order to determine population growth anticipated by the project, population projections were taken from ESRI's Business Analyst Online software, a data warehousing service that provides not only historic data from both the 1990 and 2000 Census, but also information from several other federal, state, and private sources compiled by geographic area. ESRI included past, current, and projected future data (presented in Section 4.2.1 above) which allowed for extrapolation of dwelling units to population. Additional analysis of the proposed Master Plan as it relates to the thresholds of significance was conducted in consideration of local plans, primarily the Pittsburg General Plan. Project Impacts and Mitigation Measures

Population Growth

Impact 4.2.1 The proposed Master Plan would allow for the construction of additional housing in the Master Plan area as well as retail, commercial, and quasi-public uses that will generate additional employees in the city. This growth was anticipated by the General Plan, thus the impact would be **less than significant**.

As described in Section 4.0, Assumptions, of this DEIR, the proposed project would allow for the construction of 1,168 dwelling units as well as 146,362 square feet of new retail, commercial, and quasi-public uses in the Master Plan area. Utilizing the average persons per household for 2010, described above in **Table 4.2-8**, multiplied by the number of dwelling units expected to be developed, the Master Plan is expected to result in 3,738 additional residents in the city. Furthermore, according to the assumptions in Section 4.0, the Master Plan is expected to result in employment of 1,300 persons.

It is not expected that 100 percent of jobs created as a result of development of the Master Plan will be filled by residents living in the Master Plan area. However, creation of a proportion of the 1,300 jobs would still result in minor ancillary environmental effects related to the transportation of those persons from their place of residence to work. Likewise, a portion of persons in residence in the Master Plan area will require travel to jobs off-site, resulting in similar environmental effects. The air quality effects of such travel are addressed in Section 4.6, Air Quality, of this DEIR and were considered during development of the analysis presented therein. Likewise, the transportation and traffic impacts of such growth are discussed in Section 4.4 of this DEIR.

The addition of approximately 3,738 residents and 1,300 employees in the Master Plan area will also require provision of additional service and utilities. Section 4.11, Public Services and Utilities, addresses the likely environmental impacts of providing such services. Other environmental effects from the placement of residents and employees in the Master Plan area are discussed in aggregate in the appropriate technical sections of this DEIR (Sections 4.1 through 4.13).

While the environmental effects of additional residents and employees in the Master Plan area are documented in this DEIR, the fact remains that the proposed project will result in relatively substantial growth in the City of Pittsburg compared to existing development in the rest of the city. As discussed in Section 4.1, Land Use, development of the Master Plan Area as a high-density mixed use development was anticipated and described in the Land Use Element and the greater General Plan. Development of this type was assumed in the General Plan and other planning documents, such as local Water System Master Plans (see Section 4.11, Public Services and Utilities) and others. Furthermore, as discussed in Impact 4.1.1, Section 4.1, the proposed Master Plan would allow development at a lower density than originally described in the General Plan. Therefore, while the proposed Master Plan would result in relatively substantial growth, this growth was anticipated by local planning and would result in a **less than significant** impact.

Mitigation Measures

None required.

4.2.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The cumulative setting includes the planned and approved projects discussed in Section 4.0 and listed in **Table 4.0-3**. The projects would increase development in this portion of the city and would provide additional housing, employment, and shopping opportunities.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Population, Housing, and Employment Impacts

Impact 4.2.2 Development of the proposed project, in combination with other approved, planned, or potential future projects, would contribute to additional population residing and working in the vicinity through the addition of new employment opportunities and residential units. This is a **less than cumulatively considerable** impact.

For the growth of a given project, in this instance the proposed Master Plan, to result in cumulative growth impacts, that project must require or result in the construction of certain features that by their presence would result in even greater growth in the cumulative setting. For example, a project that constructs or requires construction of a new water and sewer line where such services did not exist before could be considered to induce growth outside the project area and would therefore contribute to a cumulative effect. In the case of the proposed Master Plan, infrastructure and services installed for development in the Master Plan area would be sized and located only to provide services to the Master Plan area itself (see Section 4.11, Public Services and Utilities, of this DEIR). Local utilities and services are already located in the vicinity of the Master Plan area, as substantial urban development already exists in the vicinity.

The proposed Master Plan also includes substantial features and services for the use of BART passengers transitioning to and from the Pittsburg/Bay Point BART Station, located immediately adjacent to the Master Plan area. The Master Plan area will provide additional services for passengers. However, the bus facilities and parking provided for BART passengers on the project site will not be expanded. Such services will be reconfigured and will provide the same capacity as currently exists on the BART properties. Therefore, the Master Plan will not expand transit service to the point of inducing additional growth in the vicinity of the Master Plan area.

As the proposed Master Plan will not induce growth outside the Master Plan area, the Master Plan's contribution to cumulative impacts to population, employment, and housing is considered **less than cumulatively considerable**.

Mitigation Measures

None required.

References

City of Pittsburg. 2001. Pittsburg 2020: A Vision for the 21st Century. City of Pittsburg General Plan. Includes Amendments through July 2010.

ESRI. 2010. Census projections through 2015. Provided via subscription service.

U.S. Census Bureau. 1990. Census 1990 data. Washington D.C.

———. 2000. Census 2000 data. Washington D.C.

4.3 Hazards

This section addresses the proposed Master Plan as it relates to emergency response plans and wildland fire. The information in this section is based on review of the Pittsburg General Plan as well as local plans, policies, and environmental documentation such as the Pittsburg General Plan EIR and the Pittsburg/Bay Point BART Station Area Specific Plan and EIR. See Section 4.7, Geology and Soils, for information relating to geologic and seismic hazards. Likewise, flooding and other hydrological hazards are addressed in Section 4.8, Hydrology and Water Quality.

4.3.1 EXISTING SETTING

PROJECT SITE AND SURROUNDING USES

The portion of the Master Plan area owned by West Coast Home Builders (WCHB) is currently vacant. The eastern parcel of the Bay Area Rapid Transit (BART) property is likewise vacant. Both parcels are currently occupied by native and non-native grasses and other similar vegetation often found in undeveloped sites in the area. The remainder of the site is occupied by existing parking, bus shelters and travel lanes, and some structures serving the Pittsburg/Bay Point BART Station. The station itself is located in the center of State Route (SR) 4, immediately north of the Master Plan area. Also included on the developed portion of the BART site is a detention basin, iron fencing, and landscaping typical of parking lots (small trees, shrubbery, grass, and mulch), as well as several travel lanes for vehicles entering and leaving the property.

Access to the Master Plan area is currently provided at three points. There are two exits onto West Leland Road in the south for the use of passengers of BART and transit buses operated by one of three companies using the site. Both exits connect to West Leland Road between the intersections with Southwood Drive in the west and Oak Hills Drive in the east. Access to the Master Plan area from the north is provided by a dedicated ramp leading from the intersection of Bailey Road and the on- and off-ramps of SR 4, approximately 600 feet west of the Master Plan area. There is currently no direct vehicular access to the WCHB site, though the property does front on West Leland Road.

HAZARDOUS MATERIALS DEFINED

Under Title 22 of the California Code of Regulations (CCR), the term hazardous substance refers to both hazardous materials and hazardous wastes. Both of these are classified according to four properties: toxicity, ignitability, corrosiveness, and reactivity (CCR Title 22, Chapter 11, Article 3). A hazardous material is defined as a substance or combination of substances that may cause or significantly contribute to an increase in serious, irreversible, or incapacitating illness, or may pose a substantial presence or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed. Hazardous wastes are hazardous substances that no longer have practical use, such as materials that have been discarded, discharged, spilled, or contaminated or are being stored until they can be disposed of properly (CCR Title 22, Chapter 11, Article 2, Section 66261.10). While hazardous substances are regulated by multiple agencies, as described below in subsection 4.5.2, Regulatory Framework, cleanup requirements are determined on a case-by-case basis according to the agency with lead jurisdiction over the project.

Public health is potentially at risk whenever hazardous materials are, or will, be used. It is necessary to differentiate between the hazard of these materials and the acceptability of the risk they pose to human health and the environment. A hazard is any situation that has the potential to cause damage to human health and the environment. The risk to health and public safety is determined by the probability of exposure, in addition to the inherent toxicity of a material (DTSC 2010).

Factors that can influence the health effects when human beings are exposed to hazardous materials include the dose the person is exposed to, the frequency of exposure, the duration of exposure, the exposure pathway (route by which a chemical enters a person's body), and the individual's unique biological susceptibility.

ENVIRONMENTAL HAZARDS

Geotracker is the State Water Resources Control Board's online database that (1) provides access to statewide environmental data and (2) tracks regulatory data for the following types of sites:

- LUFT cleanup sites;
- Cleanup Program Sites (CPS; also known as Site Cleanups and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites);
- Military sites (consisting of military UST sites, military privatized sites, and military cleanup sites [formerly known as DoD non UST]);
- Land disposal sites (landfills); and
- Permitted UST facilities.

In January of 2011, a search was undertaken using GeoTracker to identify any known or suspected (reported but not yet confirmed) sources of environmental hazards in the vicinity of the Master Plan area. A search was run indicating any identified GeoTracker records within 3 miles of the Master Plan area. Beyond that distance, any impact on the Master Plan area is remote and unlikely. Thus, those records were not included in the analysis.

The GeoTracker search identified 42 records within 3 miles of the Master Plan area. Of those records, three are school investigations (surveys done prior to constructing a school) and thus of no concern. A further 16 represented past issues and hazardous releases that have been remediated and their records closed, representing no concern for the Master Plan area. The remaining 23 records and their approximate location relative to the Master Plan area are shown in **Table 4.3-1** below.

TABLE 4.3-1
IDENTIFIED HAZARDOUS MATERIALS/RELEASE SITES WITHIN 3 MILES OF THE MASTER PLAN AREA

Site Name	Status	Distance	Direction
Oak Hills South	Open – Inactive	Adjacent	E
Chevron Bay Area Pipe Line Release	Open – Inactive	0.47	NE
Criterion Catalysts & Technologies LP	Inactive – Needs Evaluation	0.70	N
Alliance Minimart	Open – Site Assessment	0.71	N
Dexter Corporation – Hysol Division	Evaluation	0.73	N
LP Catalyst Holding	Open – Assessment & Interim Remedial Action	0.74	N
Hertz Realty	Open – Site Assessment	0.81	NW
Shell Chemical Company	Evaluation	0.89	N

Site Name	Status	Distance	Direction
PG&E Shell Pond and Carbon Black Area	Active – Corrective Action	1.27	N
Acme Packaging	Inactive – Needs Evaluation	1.40	N
Port of Chicago Highway Site	Inactive – Needs Evaluation	1.53	N
PG&E/Shell – West Pittsburg	Active – Corrective Action	1.56	N
PG&E Harris Yacht Harbor	Open – Site Assessment	1.91	N
Molino Enterprises, Inc.	Open – Site Assessment	1.91	NE
Narco	Open – Inactive	1.95	E
North American Refractories	Open – Inactive	1.95	E
Western States Chemical Co	Evaluation – No Action Required	2.51	NW
Union Collier	Referred – RWQCB	2.76	NW
Triangle Wastewater Treatment	Open	2.76	E
Chemical and Pigment Co	Active – State Response	2.85	NW
Chemical and Pigment Co	Open – Inactive	2.85	NW
Evaporation Ponds	Open	2.86	NW
General Chemical Corp/Bay Point Works	Active – Corrective Action	2.97	NW

Source: SWRCB 2011
Notes: Does not include closed and remediated records. Nor are school site investigations or other non-hazards listed. Distance calculated from geographic center of Master Plan area.

WILDLAND FIRE

The Master Plan Area is located immediately adjacent to a currently vacant portion of the City. These areas, while rough-graded, include substantial areas of uncontrolled growth of grasses and other vegetation that, given the hot, dry summers experienced in the area, can result in optimal conditions for brush fires that can travel quickly. Known as the wildland urban interface, these areas can expose developed properties to fire risk from wildland fire not experienced in other areas that contain development and significant landscaping, etc. The General Plan states that the highest risk for wildland fire exists in areas of new development in the southeastern portions of the City (City of Pittsburg, 2001; p. 11-17).

4.3.2 REGULATORY FRAMEWORK

Federal, state, and local regulatory agencies that oversee hazardous materials handling and a summary of significant hazardous waste management, including the statutes and regulations these agencies administer, are listed in **Table 4.3-2** below.

TABLE 4.3-2
SUMMARY OF HAZARDOUS MATERIALS REGULATORY AUTHORITY

Regulatory Agency	Authority
Federal Agencies	
Department of Transportation (DOT)	Hazardous Materials Transport Act (49 U.S. Code [USC] 5101); Code of Federal Regulations (CFR) 49
Environmental Protection Agency (EPA)	Federal Water Pollution Control Act (33 USC 1251) Clean Air Act (42 USC 7401–7626) Resource Conservation and Recovery Act (RCRA) (42 USC 6901 et seq.) Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 USC 9601 et seq.) Superfund Amendments and Reauthorization Act (SARA) (Public Law 99-499) Federal Insecticide, Fungicide and Rodenticide Act (40 CFR Parts 150–189) Toxic Substances Control Act (15 USC 2605)
Occupational Safety and Health Administration (OSHA)	Occupational Safety and Health Act and CFR 29
State Agencies	
California Environmental Protection Agency (CalEPA)	Unified Program (California Code of Regulations [CCR], Title 27
Department of Toxic Substances Control (DTSC)	CCR, Title 22: §§ 66001–69214
Department of Industrial Relations (Cal/OSHA)	California Occupational Safety and Health Act (CCR Title 8, Div. 1, Ch. 3.2)
State Water Resources Control Board (and Regional Water Quality Control Board)	CCR Title 23, Div. 3, §§ 640–4007
	Porter-Cologne Water Quality Control Act, California Water Code, Div. 7
	Underground Storage Tank Program, CCR, Title 23, Ch. 16; Health & Safety Code, Chapters 6.7, 6.75; Assembly Bill 1702 Summary; AB 2481 Fact Sheet; AB 2481 and AB 1702 Summary Tables; Text of AB 2481
Health and Human Services Agency	CCR, Title 17
	Safe Drinking Water and Toxic Enforcement Act 1986, CCR, Title 27, § 25601
Air Resources Board and Air Pollution Control District	CCR Title 13: §§ 1900–2789 , Title 17: §§ 60000–95007, Title 26
Office of Emergency Services	Hazardous Materials Release Response Plans/Inventory Law: California Health and Safety Code (HSC), §§ 25500–25520 and Government Code §§ 8589.7. Section 2 contains excerpts from Title 19, California Code of Regulations, §§ 2720–2728.
Department of Food and Agriculture	Food and Agriculture Code
State Fire Marshall	Uniform Fire Code, CCR Title 19

FEDERAL

Environmental Protection Agency

The Environmental Protection Agency (EPA) is the primary federal agency responsible for enforcement and implementation of federal laws and regulations pertaining to hazardous materials. Applicable federal regulations pertaining to hazardous materials are contained primarily in CFR Titles 29, 40, and 49, and in the following laws: Resource Conservation and Recovery Act, Comprehensive Environmental Response, Compensation and Liability Act, and Superfund Amendments and Reauthorization Act. These laws and associated regulations include specific requirements for facilities that generate, use, store, treat, and/or dispose of hazardous materials.

Department of Transportation

The U.S. Department of Transportation (DOT), in conjunction with the EPA, is responsible for enforcement and implementation of federal laws and regulations pertaining to transportation of hazardous materials. The Hazardous Materials Transportation Act of 1974 directs DOT to establish criteria and regulations regarding the safe storage and transportation of hazardous materials. Code of Federal Regulations (CFR) 49, 171–180, regulates the transportation of hazardous materials, types of material defined as hazardous, and the marking of vehicles transporting hazardous materials.

Interagency Responsibilities

Prior to August 1992, the principal agency (at the federal level) regulating the generation, transport and disposal of hazardous waste was the EPA under the authority of the Resource Conservation and Recovery Act. As of August 1, 1992, however, the California Department of Toxic Substance Control (DTSC) was authorized to implement the State's hazardous waste management program for the EPA. The federal EPA continues to regulate hazardous substances under the Comprehensive Response Compensation and Liability Act.

STATE

California Environmental Protection Agency/Department of Toxic Substances Control

The California Environmental Protection Agency (CalEPA) and the State Water Resources Control Board establish rules governing the use of hazardous materials and the management of hazardous waste. Within CalEPA, DTSC has primary regulatory responsibility, with delegation of enforcement to local jurisdictions that enter into agreements with the state agency, for the management of hazardous materials and the generation, transport, and disposal of hazardous waste under the authority of the Hazardous Waste Control Law.

California's Secretary for Environmental Protection has established a unified hazardous waste and hazardous materials management regulatory program (Unified Program) as required by statute (Health and Safety Code, Section 25001 et seq. and implemented by regulations described in Title 26 of the CCR). The Unified Program consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities for portions of the following six existing programs:

- Hazardous Waste Generators and Hazardous Waste On-site Treatment
- Underground Storage Tanks

- Hazardous Material Release Response Plans and Inventories
- California Accidental Release Prevention Program
- Aboveground Storage Tanks (spill control and countermeasure plan only)
- Uniform Fire Code Hazardous Material Management Plans and Inventories

The statute requires all counties to apply to the CalEPA Secretary for the certification of a local unified program agency. Qualified cities are also permitted to apply for certification. The local Certified Unified Program Agency (CUPA) is required to consolidate, coordinate, and make consistent the administrative requirements, permits, fee structures, and inspection and enforcement activities for these six program elements within the county. Most CUPAs have been established as a function of a local environmental health or fire department.

California Office of Emergency Services

The California Office of Emergency Services has developed an Emergency Response Plan to coordinate emergency services provided by federal, state, and local government and private agencies. Response to hazardous materials incidents is one part of this plan. The plan is managed by the State Office of Emergency Services (OES), which coordinates the responses of other agencies including CalEPA, the California Highway Patrol (CHP), California Department of Fish and Game (CDFG), Regional Water Quality Control Board (RWQCB), Contra Costa County Fire Protection District, and City of Pittsburg Police Department.

California Department of Transportation and California Highway Patrol

The California Department of Transportation (Caltrans) and the California Highway Patrol enforce and monitor U.S. Department of Transportation hazardous materials and waste transportation laws and regulations in California. These agencies determine the container types used and issue licenses to hazardous waste haulers for the transportation of hazardous wastes on public roads.

California Department of Industrial Relations, Division of Occupational Safety and Health Administration

The Division of Occupational Safety and Health Administration (Cal/OSHA) assumes the primary responsibility for developing and enforcing workplace safety regulations. Standards for workers dealing with hazardous materials include practices for all industries (General Industry Safety Orders) including control of hazardous substances and flammable liquids, gases, and vapors. Specific practices are described for construction and hazardous waste operations and emergency response. Cal/OSHA conducts on-site evaluations and issues notices of violations to enforce improvements to health and safety practices.

LOCAL

Pittsburg Emergency Operations Plan

The City's Emergency Operations Plan (EOP) guides the operations of City services and emergency responders in the case of a range of emergencies and disasters. The EOP provides for a phased approach to disaster preparedness and response, utilizing the following phases:

- Preparedness
- Increased Readiness
- Initial Response Operations
- Extended Response Operations
- Recovery Operations

The EOP includes discussion of existing and potential hazards in the city, including those depicted in **Table 4.3-3** below.

TABLE 4.3-3
HAZARDS TO THE CITY BY LIKELIHOOD OF OCCURRENCE AND POTENTIAL SEVERITY

Hazard	Frequency			Severity		
	Infrequent	Sometimes	Frequent	Low	Moderate	High
Earthquake (M < 5)*		X		X		
Earthquake (M > 5)*	X					X
Wildland Fire	X				X	
Flooding	X			X	X	X
Levee Break	X			X	X	X
Hazardous Materials Incident		X			X	X
Civil Disturbance	X			X		
Extreme Weather	X				X	
Aircraft Crash	X			X	X	X
Train Accident	X			X	X	X
Major Vehicle Accident			X	X	X	
Terrorism	X				X	X

Source: City of Pittsburg 2005.
*Notes: * Earthquake severity given in Modified Mercalli Scale. See Section 4.7, Geology and Soils, of this DEIR for a description of these ratings.*

Pittsburg General Plan

The General Plan serves as the overriding policy document in the City of Pittsburg. The General Plan includes a Health and Safety Element guiding City efforts to ensure the safety of its residents. The majority of goals and policies listed in the Health and Safety Element concern seismic hazards, which are addressed in Section 4.7, Geology and Soils, of this DEIR. Thus, seismic hazards are not discussed here. Furthermore, the goals and policies in the Health and Safety Element that do not concern seismic hazards do not apply directly to the proposed Master Plan, as they are requirements and guidance for actions by the City, not for the design or construction of residential and commercial uses such as those described by the Master Plan. Thus, no goals or policies of the Health and Safety Element are discussed herein. Conversely, the Public Facilities Element of the General Plan includes fire protection goals and policies that apply to the Master Plan. **Table 4.3-4** provides a list of all applicable public facilities policies that relate to fire hazards and the proposed Master Plan's consistency with those goals and policies. While this DEIR analyzes the Master Plan's consistency with the General Plan pursuant to State CEQA Guidelines Section 15125(d), the Pittsburg City Council has the responsibility of ultimately determining the proposed Master Plan's consistency with the General Plan.

TABLE 4.3-4
PROJECT CONSISTENCY WITH APPLICABLE GENERAL PLAN FIRE PROTECTION POLICIES

General Plan Policies	Consistent with General Plan	Analysis
Goal 11-G-8 – Require development in areas of high fire hazard to be designed and constructed to minimize potential losses and maximize the ability of fire personnel to suppress fire incidents.	Undetermined	Specific building designs and details of development have not been developed for the Master Plan Area. Therefore, it cannot be determined if future development in the Master Plan Area would conform to this Goal. However, the Pittsburg Municipal Code, Chapter 15.20, requires the application of necessary fire hazard mitigation, in the form of sprinklers, firebreaks, and other measures, which would be required of future development in the Master Plan Area.
Policy 11-P-29 – Ensure adequate road widths in new development for fire response trucks, per the subdivision regulations.	Undetermined	Initial consultation with the Contra Costa County Fire Protection District (CCCFPD), conducted by City staff, indicated that the roadways shown in the Master Plan will be adequate for access by fire trucks. Once internal roadways have been fully designed, the Fire District will have to approve those roadways as a requirement of normal permit processes in the City.

4.3.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The impact analysis provided below is based on the following State CEQA Guidelines, as listed in Appendix G. Impacts to hazardous materials and risk of upset would be significant if the proposed Master Plan would:

1) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

2) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

3) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

4) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment.

5) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area.

6) For a project within the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area.

7) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

8) Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

According to the Initial Study for the proposed Master Plan, released by the City concurrently with the Notice of Preparation on December 7, 2010, less than significant impacts were found regarding thresholds 1 through 4 above due to the application of existing federal, state, and local laws and regulations regarding hazardous materials handling and project siting, as well as a records search conducted as part of the preparation of the Initial Study. However, concerns raised by commenters during the NOP comment period precipitated their consideration here. In regard to airport impacts (thresholds 5 and 6 above), the Initial Study found no impact would occur because there are no airports in the vicinity of the Master Plan area. Pursuant to State CEQA Guidelines Section 15128, no additional documentation of thresholds 5 and 6 is required in the EIR, nor is such documentation included here.

METHODOLOGY

This analysis is based primarily on review of applicable plans (General Plan, Emergency Response Plan, etc.). Additional information was provided by consultation with the Contra Costa County Fire Protection District (CCCFPD).

PROJECT IMPACTS AND MITIGATION MEASURES

Emergency Response Plans

Impact 4.3.1 Implementation of the proposed Master Plan would result in additional residences and commercial development in the Master Plan area anticipated by local emergency planning. Furthermore, internal features of the Master Plan would not interfere with emergency response actions through traffic impacts and roadway designs. This is considered a **less than significant** impact.

As described in Section 4.0, Assumptions, and Section 4.2, Population, Housing, and Employment, the proposed Master Plan is expected to result in the construction of 1,168 dwelling units, 146,362 square feet of nonresidential structures, and the addition of approximately 3,738 residents and 1,300 employees to the area. These additional people, structures, and other resources increase the overall number of people and structures that must be considered by local and regional emergency response agencies when executing the requirements of the Pittsburg Emergency

Response Plan and the California Emergency Response Plan. However, as the Pittsburg General Plan expected development similar to that proposed for the Master Plan area, and as the Pittsburg Emergency Response Plan was formulated with the buildout of the General Plan in mind, growth as a result of the Master Plan was anticipated and any impacts on the emergency response plans is expected to be minor.

The proposed Master Plan includes roadways and internal features that could, by their nature or design, interfere with rapid response to an emergency in the Master Plan area. The City undertook consultation with the CCCFPD in September 2010 asking, among other things, about the internal roadway cross sections and designs and their effect on department response. The response from CCCFPD was generally positive, in which they stated the on-site roads would not be expected to interfere with CCCFPD response to emergencies on-site. On-site roadways have not yet been designed, and the alignment and physical characteristics of on-site roads may change somewhat during the process of developing the Master Plan. However, the City and CCCFPD would require any future roadways constructed on-site to provide adequate emergency access.

As the Pittsburg Emergency Response Plan considered development of the scale and type proposed by the Master Plan, and as on-site roadways are expected to be adequate for emergency access, the impacts of the proposed Master Plan are expected to be **less than significant.**

Mitigation Measures

None required.

Wildland Fire Hazards

Impact 4.3.2 The proposed Master Plan is surrounded by existing and approved development. This, coupled with required implementation of existing fire safety regulations, will ensure that the proposed Master Plan has a **less than significant** impact.

The Master Plan area is surrounded by development or areas proposed to be developed. However, land to the west of the Master Plan area is currently vacant and dry for much of the year. As a result, fire hazards in these areas are high. Development of the Master Plan area could result in a fire risk by introducing residential development abutting these wildlands and create an urban-wildland interface (City of Pittsburg 2001, p. 11-17). The highest risk occurs during the wildland fire season, which spans June to October. Much of the threat is due to open grasslands abutting residential developments, such as would occur on the proposed project site (Ibid.).

Until development occurs to the west of the project site, it could be prone to urban-wildland interface and wildland fire hazards. This is a temporary condition that would exist only if uses on the WCHB property are constructed prior to development of the adjacent parcel in the Alves Ranch project. The Pittsburg Municipal Code includes specific fire safety requirements in Chapter 15.20. Requirements in that chapter for the formation of firebreaks and clearing of weeds and other fire hazards, when appropriate, will ensure that wildland fire hazards represent a **less than significant** impact.

Mitigation Measures

None required.

Environmental Hazards

Impact 4.3.3 The proposed Master Plan would introduce development within 3 miles of identified hazards materials release and cleanup efforts. However, these sites do not represent a threat to the Master Plan Area and this would have a **less than significant** impact.

The proposed Master Plan would be expected to result in development of both residential and nonresidential land uses on the project site, as well as substantial new transit and transportation uses. This development would place new residents and new employees in the Master Plan area (see Section 4.0, Assumptions, and Section 4.2, Population, Housing, and Employment). As shown in **Table 4.3-1**, there are 23 identified sites of hazardous materials release or ongoing investigation into possible release within 3 miles of the Master Plan area. Mitigating the potential hazards of these sites is the fact that they concern subsurface and surface releases of contaminants. While approximately 5 to 15 percent of the project's water needs will be met by groundwater (see Section 4.11, Public Services and Utilities), the wells providing that groundwater are located 5 miles to the east and would not be affected by these sites. Further reducing the impact is the fact that those sites found north of the Master Plan area (19 of the 23) are located at lower elevations than the Master Plan area, preventing any surface contamination from affecting the Master Plan area. As for the remaining sites, both the Narco and North American Refractories sites are more than 2 miles distant and at a lower elevation than the Master Plan area. The Triangle Wastewater Treatment record does not concern a spill or release, simply the presence of a facility that treats a hazardous material (wastewater). No hazard is indicated. Lastly, the Oak Hills South record corresponds with the Oak Hills Shopping Center, located immediately adjacent to the Master Plan area. No details are available as to the nature of the record; though the record is marked as inactive, which typically indicates that while a release may have occurred or is suspected to have occurred, the release was not expected to result in any identifiable hazard and no action has been required. This is often the case with one-hour-photo operations (such as may exist or may have existed in the drugstore in the Oak Hills Shopping Center) or the operation of a dry cleaner. As this record is inactive, it is anticipated that any impact to the Master Plan would be negligible.

Construction and operation of the Master Plan would be expected to utilize certain hazardous materials common to such projects. These materials are limited to industrial solvents, oils, paints, coatings, and other typical construction and operational chemicals and materials. No substantially hazardous materials are expected to be required, such as radioactive materials or explosives. As such, any potential hazards from these materials are likely to be minimal. Implementation of water quality standards and best management practices would ensure that use of these materials would not seep into the ground or surface water (see Section 4.8, Hydrology and Water Quality).

Considering the characteristics and location of identified hazardous sites as well as the expected chemicals and other hazardous materials expected to be utilized in the Master Plan area, any potential environmental hazard impact is expected to be **less than significant**.

Mitigation Measures

None required.

4.3.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The cumulative setting for hazards associated with the proposed project includes proposed, planned, approved, or reasonably foreseeable projects listed in **Table 4.0-3** in Section 4.0, Assumptions, of this DEIR. The cumulative setting also includes existing uses in the City of Pittsburg and the Bay Point neighborhood.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Hazards

Impact 4.3.4 Implementation of the proposed project, in addition to existing, approved, proposed, and reasonably foreseeable development in the area, would contribute to an increase in potential conflicts with emergency response plans and wildland fire hazards. Considering site-specific conditions, this is considered a **less than cumulatively considerable** impact.

As discussed in Impact 4.3.1 above, the proposed project will incrementally increase the number of people and structures within the cumulative setting that may require emergency services in the case of a large disaster. However, the growth expected of the project was anticipated in the Pittsburg General Plan as well as in other area planning efforts. County emergency resources near to the project likewise anticipated such growth, as described by the Pittsburg/Bay Point BART Station Area Specific Plan EIR (Contra Costa County and City of Pittsburg 2001). Therefore, while the proposed Master Plan will contribute to a cumulative increase in people and structures, growth as a result of the Master Plan was expected and included in preparation of hazards and emergency response plans. The contribution of the Master Plan would be less than cumulatively considerable.

Wildland fire hazard is a product of the location and surrounding land features and uses of a given site. Unless a project includes specific features that would increase the regional fire danger (e.g., storage of flammable materials or explosives), the hazard of wildland fire is not considered cumulative. As the proposed Master Plan would result in typical urban development, surrounded by more urban development, the project would not be expected to contribute to any cumulative wildland fire hazard.

Considering the above factors, the proposed Master Plan's contribution to cumulative hazards impacts in the vicinity of the Master Plan area would be **less than cumulatively considerable**.

Mitigation Measures

None required.

REFERENCES

Contra Costa County and City of Pittsburg. 2001. Pittsburg/Bay Point BART Station Area Specific Plan Environmental Impact Report (Recirculated). Prepared in conjunction with Bay Area Rapid Transit. SCH 98022071.

California Department of Toxic Substances Control (DTSC). 2010. http://www.dtsc.ca.gov/.

City of Pittsburg. 2001. Pittsburg 2020: A Vision for the 21st Century. City of Pittsburg General Plan. Includes Amendments through July 2010.

———. 2005. Pittsburg Emergency Response Plan (update).

State Water Resources Control Board (SWRCB). 2011. GeoTracker. http://geotracker.swrcb.ca.gov/.

4.4 Transportation and Traffic

This section of the Draft Environmental Impact Report (Draft EIR or DEIR) for the proposed Pittsburg/Bay Point BART Master Plan focuses on the anticipated increase in vehicular traffic, impacts to other modes of transportation, and site access resulting from the proposed Master Plan. This section was prepared by Fehr & Peers Transportation Consultants.

This section describes the existing transportation network (automobile traffic, transit, pedestrian, and bicycle facilities). It also estimates the increase in traffic in the project area that could result from project implementation and describes the resulting impacts on the transportation system. As part of the analysis, traffic conditions have been analyzed under the following scenarios:

- **Existing Conditions**: This scenario is based on existing (2010) traffic counts.
- **Existing Plus Project Conditions**: This scenario adds the traffic generated by the proposed project to the Existing Conditions traffic volumes.
- **Cumulative (2035) No Project Conditions**: This scenario is based on year 2035 traffic volume forecasts and assumes no developments on the Master Plan area.
- **Cumulative (2035) Plus Project Conditions**: This scenario adds the traffic generated by the proposed project to the Cumulative No Project Conditions traffic volumes.

Further, transportation impacts which may result during the construction of the proposed project are identified and analyzed. Supporting analysis is included as **Appendix C** of this Draft EIR.

4.4.1 EXISTING SETTING

The proposed project is located on the north side of West Leland Road, west of Bailey Road and south of State Route (SR) 4 in the City of Pittsburg. Major roadways and intersections in the vicinity of the Master Plan area are described below. Additionally, alternative transportation systems, including transit services and bicycle and pedestrian facilities, are identified and described.

EXISTING TRANSPORTATION NETWORK

Regional access to the project area is provided via SR 4, and local access is provided via West Leland Road and Bailey Road. These roadways are described below. **Figure 4.4-1** shows the project area, including major roadways, and indicates the study intersection locations.

Project Area Roadways

State Route 4 (SR 4) is an east-west freeway that serves as the main access between eastern Contra Costa County and Interstate 680 and Interstate 80 to the west. SR 4 provides four travel lanes in the project vicinity, including a high-occupancy vehicle (HOV) lane, in each direction. SR 4 has an average annual daily traffic (AADT) volume of about 143,000 vehicles west of Bailey Road (Caltrans 2009).

Bailey Road provides direct access to the Master Plan area from the east and is a major north-south arterial between Willow Pass Road to the north and the City of Concord to the south. Bailey Road provides access to SR 4 through a freeway interchange northeast of the Master Plan area. Bailey Road varies in width, providing one to three lanes in each direction through the project vicinity. On-street parallel parking is allowed on both sides of the street south of West Leland Road to Willow Avenue. A center median is provided north of West Leland Road.

West Leland Road provides direct access to the Master Plan area from the south and is a major east-west arterial between San Marco Boulevard in the west and Century Boulevard in the east where it continues as Delta Fair Boulevard. West Leland Road provides two lanes in each direction with a landscaped center median and bike lanes in the project vicinity.

Willow Pass Road is an east-west arterial that links the Bay Point community with downtown Pittsburg. At its western end, the road curves south and becomes San Marco Boulevard south of SR 4. East of Bailey Road, the roadway operates as a three-lane roadway with one through lane in each direction and a two-way center left turn lane. West of Bailey Road, the roadway provides an additional through lane in each direction. In the vicinity of the Master Plan area, Willow Pass Road has bike lanes in each direction.

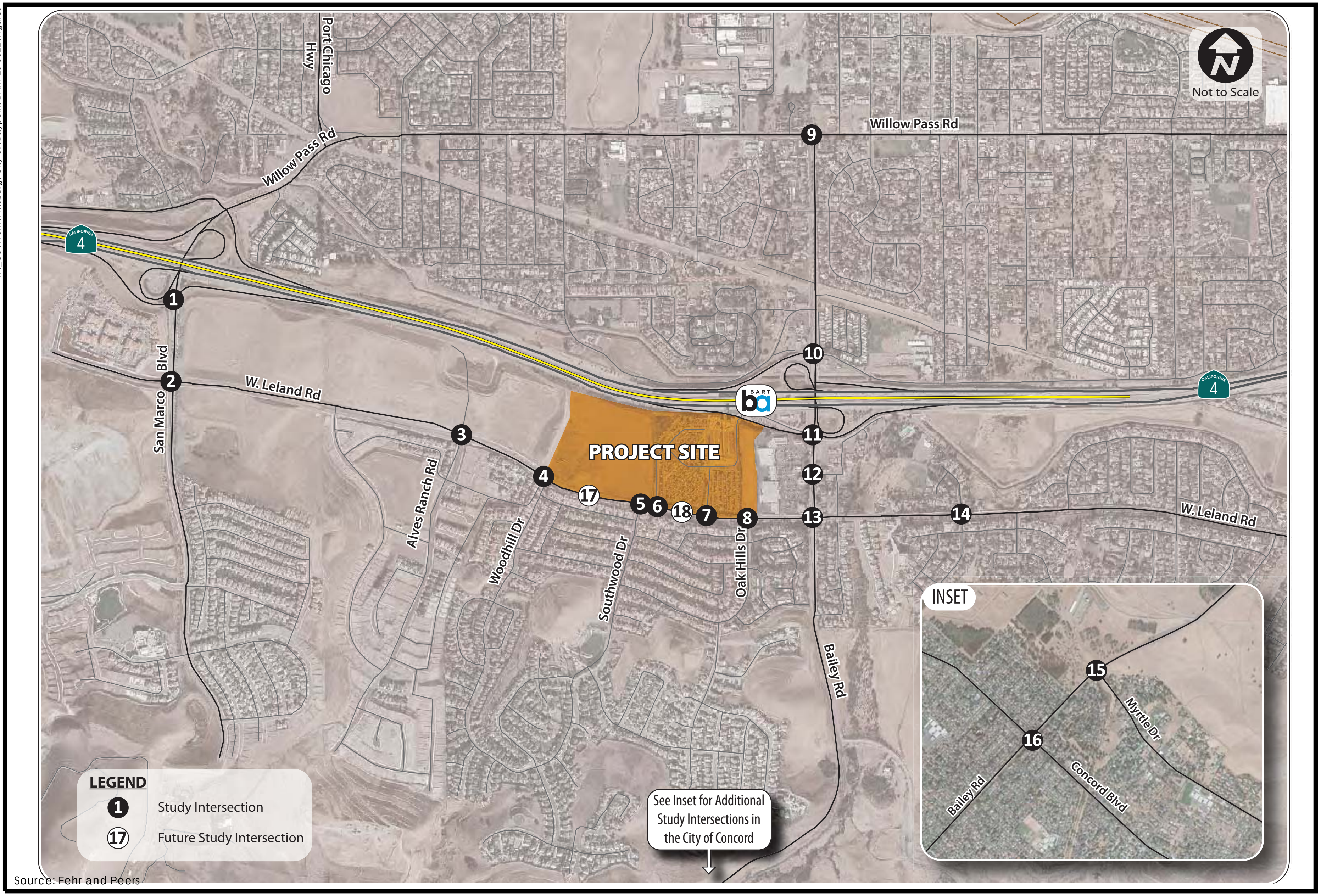
Southwood Drive is a north-south collector with a northern terminus at West Leland Road that serves the neighborhood immediately south of the Pittsburg/Bay Point BART Station. Southwood Drive intersects West Leland Road at a signal less than 200 feet west of the east BART (outbound) driveway on West Leland Road. Southwood Drive is a two-lane residential street with preferred residential permit parking on both sides of the street.

Oak Hills Road is a north-south local street with a northern terminus at West Leland Road that serves the neighborhood immediately south of the Pittsburg/Bay Point BART Station. Oak Hills Road intersects West Leland Road at an unsignalized intersection less than 500 feet east of the west BART (inbound) driveway on West Leland Road and less than 400 feet west of the entrance to the Oak Hills Shopping Center. Oak Hills Road is a two-lane residential street with preferred residential permit parking on both sides of the street.

BART Station Access and Circulation

Vehicular access to the Pittsburg/Bay Point BART Station currently consists of three driveways. Two signalized driveways (one inbound and one outbound) provide vehicular access to and from West Leland Road. A two-way access road provides signalized access to Bailey Road, just south of SR 4 at the Bailey Road/SR 4 Eastbound Ramps intersection. Vehicle movements are prohibited between the BART access road and Bailey Road to the south. **Figure 4.4-2** shows the existing on-site vehicular circulation system.

The station currently provides separate bus, passenger loading, and parking circulation. These components are connected with pedestrian paths and vehicular circulation roadways. The BART site is delineated by two-lane vehicular circulation roadways into four parking lots and an intermodal center. These roadways are two-way, except on the south end of the Master Plan area where the two north-south roadways provide one-way inbound/outbound access to and from West Leland Road. The outbound roadway provides one southbound left turn lane and one southbound right turn lane. The east-west circulation roadway becomes the access roadway that connects to Bailey Road. All internal intersections are unsignalized and most provide painted crosswalks. Most of the internal intersections are controlled by all-way stops. The 2,000-space parking lot consists of mostly one-way parking aisles with a typical aisle width of 16 feet.



Not to Scale

N

Figure 4.4-1

Project Vicinity

PMC®

Not to Scale

N

Figure 4.4-2

Existing On-Site Vehicular Circulation System

PMC®

The Pittsburg/Bay Point BART Station provides two designated pick-up/drop-off areas at the intermodal center consisting of two separate roadways with curb space and parking spaces. Taxis are available in the passenger loading area on the west side of the intermodal center. During the evenings, the passenger loading area on the east side of the intermodal center is the busiest, with vehicle queues observed spilling back from that loading area to the inbound lane of the circulatory roadway that provides access from Bailey Road.[1]

Project Study Intersections

The information presented in this section concerns the area in the vicinity of the Master Plan Area referred to as the "study area." Likewise, intersections analyzed in the study area are known as "study intersections."

Generally, the closer an intersection or roadway is to the proposed project, the larger the impact will be as traffic from the project is concentrated. As a result, most of the study intersections and roadway segments are near the Master Plan area. As traffic moves away from the Master Plan area, the impacts of project-related traffic represent a smaller percentage of the existing traffic, which means the impacts are smaller overall. **Table 4.4-1** shows the intersections and freeway segments that were determined to be most affected by the proposed project and therefore analyzed for this DEIR.

TABLE 4.4-1
PITTSBURG/BAY POINT BART TRAFFIC IMPACT STUDY AREA

Intersections	
1. Willow Pass Road (San Marco Boulevard)/SR 4 Eastbound Ramps 2. San Marco Boulevard/West Leland Road 3. Alves Ranch Road/West Leland Road 4. Woodhill Drive/West Leland Road 5. Southwood Drive/West Leland Road 6. BART Exit (A Street in Plus Project conditions)/West Leland Road 7. BART Entrance (C Street in Plus Project conditions)/West Leland Road 8. Oak Hills Drive/West Leland Road	9. Bailey Road/Willow Pass Road 10. Bailey Road/Canal Road/SR 4 Westbound On-Ramp 11. Bailey Road/SR 4 Eastbound Ramps 12. Bailey Road/Maylard Street 13. Bailey Road/West Leland Road 14. Chestnut Drive/West Leland Road 15. Bailey Road/Myrtle Drive (Concord) 16. Bailey Road/Concord Boulevard (Concord) 17. West Leland Road/F Street (Plus Project conditions only) 18. West Leland Road/B Street (Plus Project conditions only)
Freeway Segments	
SR 4 west of San Marco Boulevard SR 4 west of Bailey Road SR 4 east of Bailey Road	

[1] Fehr & Peers observation between 6:00 and 7:00 PM on Tuesday, April 21, 2009.

Transit Service

Transit providers serving the Pittsburg/Bay Point BART Station include Tri Delta Transit, which provides local and express bus service in eastern Contra Costa County as well as paratransit services, and Rio Vista Delta Breeze Transit, which operates one route twice a week to the station. **Figure 4.4-3** shows the on-site transit circulation and bus stop locations surrounding the existing BART station.

Buses serving the Pittsburg/Bay Point BART Station access the station from either Bailey Road or West Leland Road, and they stop at the bus island, located in the middle of the intermodal center between the taxi and passenger loading areas. The bus island is a covered pedestrian path with seating that provides BART patrons a direct connection between the BART station entrance and the bus stops without crossing any roadways. The bus island varies between 20 and 25 feet in width.

The roadway around the bus island is restricted to buses and is over 40 feet wide to accommodate bus maneuvers and bus layovers. The roadway consists of eight saw-tooth bus bays, 50 feet in length, around the bus island and a paratransit stop at the northeast entrance from Bailey Road. The paratransit stop is frequently used by other buses as a drop-off location. All nine bus stops are currently in use by the transit providers, and several stops serve multiple routes. The Delta Breeze buses share a bus bay with Tri Delta Transit. Along the Master Plan area's east-west vehicular circulation roadway is an additional 140-foot-long turnout bay that is not currently used. These bays are signed to restrict stopping at any time.

Each transit service is described below. Data presented in this report is based on bus routes in service as of February 2011.

Tri Delta Transit

Tri Delta Transit primarily provides bus service in four cities (Pittsburg, Antioch, Oakley, and Brentwood) and adjacent unincorporated areas in Contra Costa County. Tri Delta Transit operates nine weekday and three weekend and holiday bus routes that directly serve the Pittsburg/Bay Point BART Station. **Table 4.4-2** summarizes the characteristics of the Tri Delta Transit routes serving the project area, including daily ridership of each bus route.

Tri Delta Transit estimates its system-wide daily ridership at 9,700 passengers on weekdays, 2,900 passengers on Saturdays, and 2,000 passengers on Sundays and holidays. According to an onboard survey of passengers in 2007, approximately 20 percent of all Tri Delta Transit passengers identified the Pittsburg/Bay Point BART Station as an origin, destination, or both. Therefore, approximately 1,900 Tri Delta Transit passengers board or alight a bus at the BART station. Many of these passengers transfer between the bus and BART, while others transfer between buses, and others use another mode of travel to access the buses at the BART station.[2]

All Tri Delta Transit buses are equipped with bicycle racks, which accommodate up to two bikes in front of the buses. Tri Delta Transit also operates keyed bike lockers available at various park-and-ride locations, such as in Antioch, Brentwood, Pittsburg, and Discovery Bay.

[2] Based on data provided by and conversations with Tri Delta Transit staff in May 2009.

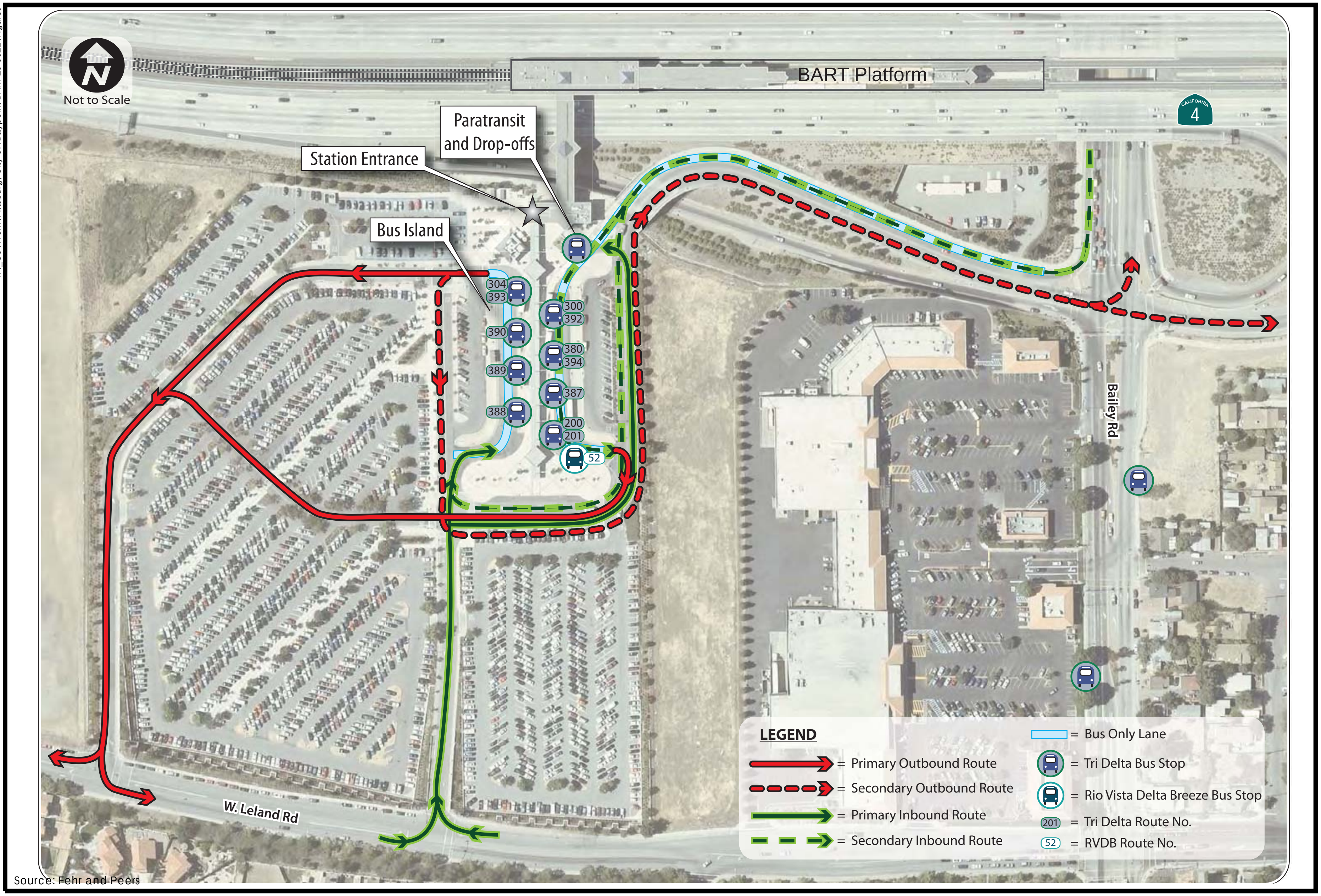


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Figure 4.4-3

Existing On-Site Bus Facilities and Circulation

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TABLE 4.4-2
TRANSIT SERVICE SUMMARY

Line	Route	Weekday		Weekend		Average Daily Ridership[1]
		Hours	Headway	Hours	Headway	
Tri Delta Transit Local Routes						
201 (Concord – weekdays)	Pittsburg/Bay Point BART to Concord BART via Leland, Bailey, and Willow Pass	6:00 AM to 7:30 PM	1 hour/30 minutes	No service		442
380 (Hillcrest Park & Ride – weekdays)	Pittsburg/Bay Point BART to Bay Point to downtown Pittsburg via Willow Pass, Antioch, and Hillcrest Park & Ride	3:15 AM to 11:20 PM	1 hour/30 minutes during peak commute hours	No service		2,611
387 (Tri Delta Antioch – weekdays)	Pittsburg/Bay Point BART to downtown Pittsburg via Willow Pass, and downtown Antioch	4:45 AM to 9:15 PM	1 hour	No service		909
388 (Hillcrest Park & Ride – weekdays)	Pittsburg/Bay Point BART to Pittsburg Park & Ride via Leland, Antioch, Hillcrest Park & Ride, and Kaiser Deer Valley	5:00 AM to 11:30 PM	45 minutes/ 1 hour in late evenings	No service		1,340
389 (Bay Point – weekdays)	Loop Route between Bay Point and Pittsburg/Bay Point BART via Willow Pass	4:40 AM to 10:30 PM	1 hour	No service		311
391 (Brentwood Park & Ride – weekdays)	Pittsburg/Bay Point BART to Pittsburg Park & Ride, Hillcrest Park & Ride, Oakley, and Brentwood	4:00 AM to 1:15 AM	1 hour/30 minutes during peak commute hours	No service		1,447
392 (Hillcrest Park & Ride – weekends)	Pittsburg/Bay Point BART to Pittsburg Park & Ride via Willow Pass, and Hillcrest Park & Ride	No service		Sat: 5:20 to 1:30 AM; Sun: 6:30 to 1:30 AM	1 hour	1,226
393 (Brentwood Park & Ride – weekends)	Bay Point to Pittsburg/Bay Point BART via Willow Pass, Hillcrest Park & Ride via Leland, and Brentwood	No service		Sat: 5:20 to 1:30 AM; Sun: 6:20 to 1:30 AM	1 hour	1,219
394 (Antioch – weekends)	Pittsburg/Bay Point BART to Pittsburg via Willow Pass, Antioch, and Hillcrest Park & Ride	No service		7:00 AM to 8:30 PM	1 hour	519

Line	Route	Weekday		Weekend		Average Daily Ridership[1]
		Hours	Headway	Hours	Headway	
Tri Delta Transit Express Routes						
200 (Martinez/Pittsburg – weekdays)	Pittsburg/Bay Point BART to Martinez Amtrak via Leland and SR 4	6:45 AM to 7:00 PM	1 hour	No service		260
300 (Brentwood – weekdays)	Pittsburg/Bay Point BART to Brentwood Park & Ride via SR 4	4:00 AM to 10:00 PM	30 minutes/20 minutes during peak commute hours	No service		1,342
390 (Hillcrest Park & Ride – weekday commute hours)	Pittsburg/Bay Point BART to Hillcrest Park & Ride via Leland and Buchanan (no PM westbound service)	4:00 AM to 8:00 AM & 4:30 PM to 8:00 PM	30 minutes	No service		235
Rio Vista Delta Breeze						
52 (SR 160 Express)	Pittsburg/Bay Point BART to Antioch and Rio Vista via SR 4/SR 160	Two per direction on Mondays, Wednesdays and Fridays; three per direction on Tuesdays and Thursdays		Two buses in each direction on Saturdays only		N/A

Sources: Tri Delta Transit 2009
Notes: 1Average Daily Ridership is the average total ridership for each route, as of February 2009.

Rio Vista Delta Breeze

The Rio Vista Delta Breeze provides bus service within Rio Vista and provides service from Rio Vista to Isleton, Fairfield, Suisun City, Lodi, the Pittsburg/Bay Point BART Station, and Antioch. Delta Breeze operates a bus route that provides one bus trip in each direction between Rio Vista and the Pittsburg/Bay Point BART Station on two days of the week. Delta Breeze buses are equipped with bicycle racks, which accommodate up to two bikes in front of the buses.

BART Service

BART is the regional rapid transit provider and connects the study area to other parts of Contra Costa County, Alameda County, San Francisco, and northern San Mateo County. BART provides service to 44 stations. The Pittsburg/Bay Point BART Station is the end-of-the-line station on the Pittsburg/Bay Point – San Francisco International Airport line. The station also serves as a multimodal transfer facility for buses in eastern Contra Costa County. About 160 daily trains serve the Pittsburg/Bay Point BART Station.

The Pittsburg/Bay Point BART Station is located in the median of SR 4 immediately north of the Master Plan area and just west of the interchange with Bailey Road. The station opened in 1996. It can be accessed from the south and is adjacent to a 2,000-space surface parking lot located in the Master Plan area.

The Pittsburg/Bay Point BART Station provides service from 4:00 AM to 1:20 AM on weekdays, with typical train headways of 15 minutes before 8:00 PM and 20 minutes after 8:00 PM. On weekends and holidays, service is provided from 6:00 AM (8:00 AM on Sundays) to 1:20 AM with 20-minute headways.

BART Ridership

In 2008, there were about 5,110 daily riders at this station. **Table 4.4-3** summarizes the number of weekday boardings and alightings by time of day. Although the BART system's AM peak hour is between 7:30 and 8:30 AM, more patrons arrive at the Pittsburg/Bay Point BART Station between 6:30 and 7:30 AM. The station's PM peak hour is between 5:30 and 6:30 PM, which coincides with the BART system peak hour.

Table 4.4-4 summarizes the number of weekday and peak hour boardings and alightings, by access mode for the Pittsburg/Bay Point BART Station based on passenger surveys conducted in the spring of 2008. The majority of patrons arrived at the station by automobile. The high automobile mode share can be attributed to the fact that the station is served by a nearly 2,000-space parking lot and the catchment area has a mostly suburban character.[3] The catchment area is also very large because the station is located at the end of the line and several communities are located east of the station.

Table 4.4-5 summarizes load factors by line and direction for the BART lines serving the station. The data assumes nine car trains during peak demand and is based on 2008 Pittsburg/Bay Point BART Station ridership data. Individual BART carloads, in terms of passengers per car, for the lines passing through the station were collected during the spring of 2008. Using a total capacity per car of 92 passengers (67 seated and 25 standing), the BART lines are operating under capacity

[3] Catchment area refers to the most likely service areas for a BART station. These areas are based on the proximity to the station, the ease of access over different transportation modes, and relative location of other BART stations.

at the Pittsburg/Bay Point BART Station. These loading data are consistent with the fact that the station is at the end of the line.

TABLE 4.4-3
BOARDINGS AND ALIGHTINGS BY TIME OF DAY - PITTSBURG/BAY POINT BART STATION

Time of Day[1]	Boardings		Alightings	
	Demand	Percentage of Day	Demand	Percentage of Day
Early AM (3:30 AM – 6:29 AM/3:30 AM – 6:59 AM)	1,587	30%	50	1%
AM Pre-Peak Shoulder (6:30 AM – 7:29 AM/7:00 AM – 7:59 AM)	1,253	25%	60	1%
AM Peak 2 (7:30 AM – 8:29 AM/8:00 AM – 8:59 AM)	551	11%	74	1%
AM Post-Peak Shoulder (8:30 AM –9:29 AM/9:00AM – 9:59 AM)	289	6%	61	1%
Midday (9:30 AM – 3:59 PM/10:00 AM – 4:29 PM)	912	18%	1,275	25%
PM Pre-Peak Shoulder (4:00 PM – 4:59 PM/4:30 PM – 5:29 PM)	124	2%	903	18%
PM Peak[2] (5:00 PM – 5:59 PM/5:30 PM – 6:29 PM)	103	2%	1,115	22%
PM Post-Peak Shoulder (6:00 PM – 6:59 PM/6:30 PM – 7:29 PM)	82	2%	655	13%
Evening (7:00 PM – 1:59 AM/7:30 PM – 1:59 AM)	209	4%	926	18%
Totals	**5,110**	**100%**	**5,118**	**100%**

Source: BART 2008;
Notes: 1. Time of Day listed as: (Boarding Time Range/Alighting Time Range)
2. BART systemwide peak hour

TABLE 4.4-4
BART BOARDINGS/ALIGHTINGS MODE OF ACCESS/EGRESS

Time of Day	Mode	Boarding Mode of Access		Alighting Mode of Egress	
		Pittsburg/ Bay Point	Systemwide[1]	Pittsburg/ Bay Point	Systemwide[1]
AM Peak (7:30 AM – 8:29 AM) [2]	Walk/Bike	7%	30%	27%	82%
	Transit	30%	15%	46%	15%
	Drive[3]	63%	55%	27%	3%
	Total	100%	100%	100%	100%
PM Peak (5:00 PM – 5:59 PM) [2]	Walk/Bike	29%	79%	4%	40%
	Transit	47%	14%	13%	16%
	Drive[3]	24%	7%	83%	44%
	Total	100%	100%	100%	100%

Time of Day	Mode	Boarding Mode of Access		Alighting Mode of Egress	
		Pittsburg/ Bay Point	Systemwide[1]	Pittsburg/ Bay Point	Systemwide[1]
Total Daily	Walk/Bike	6%	56%	8%	59%
	Transit	22%	16%	22%	18%
	Drive[3]	72%	28%	71%	23%
	Total	100%	100%	100%	100%

Source: *BART 2008;*
Notes: *1. Overall system-wide totals do not include San Francisco International Airport. In addition, the system-wide data shown here use an origin weight, rather than an origin/ destination weight, and thus will vary slightly from data published by BART.*
2. BART system peak hour, which may not represent the peak hours at the stations. AM peak hour alighting and PM peak hour boarding data for the Pittsburg/Bay Point BART Station based on a very small sample size; thus, data may not be very accurate.
3. Drive access includes single occupancy vehicle, carpool, motorcycle, taxi, and drop-off.

TABLE 4.4-5
PEAK HOUR LOADS AT PITTSBURG/BAY POINT BART STATION

Line	Total Capacity[1] (Passengers/Car)	Maximum Load Peak Hour	Maximum Load[2] (Passengers/Car)	Load Factor
Pittsburg/Bay Point-SFO Airport	92	1,253	35	0.38
SFO Airport-Pittsburg/Bay Point	92	1,115	31	0.34

Source: *BART 2009.*
Notes: *1. Total capacity includes 67 seated and 25 standing passengers.*
2. Maximum load computed based on 9-car trains.

East Contra Costa BART Extension (eBART)

The East Contra Costa BART Extension (eBART) project would provide extended BART service east of the current terminus at the Pittsburg/Bay Point BART Station. This new extension will utilize a different type of train from the current BART network but would be functionally similar to other BART services. As with the current BART line, the eBART line would operate in the centerline of SR 4 and would provide service only between the Pittsburg/Bay Point BART Station and two stations to the east, one at Railroad Avenue and one at Hillcrest Avenue.

Bicycle Facilities

Pittsburg's climate can be challenging for bicyclists during the summer due to extreme heat during the afternoon. However, during much of the spring and fall, and during parts of winter, Pittsburg's climate can be ideal for bicycling. The hilly topography to the south of the BART station can also be challenging for bicyclists, but the topography to the west, east, and north of the station is generally flat.

Bicycle facilities can be classified into the following types:

- **Class I Bikeway (Bike Path)** – A completely separate facility designated for the exclusive use of bicycles and pedestrians with vehicle and pedestrian cross-flow minimized.

- **Class II Bikeway (Bike Lane)** – A striped lane designated for the use of bicycles on a street or highway. Vehicle parking and vehicle/pedestrian cross-flow are permitted at designated locations.

- **Class III Bikeway (Bike Route)** – A route designated by signs or pavement marking for bicyclists within the vehicular travel lane (i.e., shared use) of a roadway.

Currently, the following bicycle facilities, as shown on **Figure 4.4-4**, are provided near the proposed project:

Class I facilities consist of the Delta de Anza and Bel Air trails. The Delta de Anza Trail is routed along Bailey Road (it is not a Class I facility here) from just north of Canal Road to just south of State Route 4. South of SR 4, the trail is an east-west Class I facility providing access to Ambrose Park and extending to points east. North of Canal Road, the trail is an east-west Class I facility extending to points west. At this location, the Bel Air Trail, a Class I facility, extends to the east, providing access to Bel Air Elementary School. A signal on Bailey Road provides a protected crossing between these two trails.

Class II facilities consist of bike lanes along West Leland Road. In addition, Bailey Road provides a shoulder stripe, but lacks appropriate bicycle lane markings or signage. However, Class II bicycle lanes are planned for Bailey Road.

While local and collector roadways may be used by bicyclists, unless otherwise prohibited, none are designated as bicycle routes or provide designated bicycle facilities.

The existing Pittsburg/Bay Point BART Station offers 44 bicycle parking spaces, including 20 keyed lockers, which are for single use and require a long-term rental agreement with BART, and 12 racks that can accommodate two bicycles per rack. BART allows bicycles on trains, except during peak weekday commute hours, as indicated by the BART schedule. Bicycles are not allowed on BART at the Pittsburg/Bay Point BART Station between 6:15 and 8:15 AM. BART riders returning to the Pittsburg/Bay Point BART Station from the Walnut Creek BART Station and points west are not allowed to carry bicycles on BART during the PM peak commute period, which includes trains arriving to Pittsburg/Bay Point between 5:15 and 7:30 PM. Bicycles are also not allowed on BART west of downtown San Francisco and on other BART lines during the PM peak commute period.

Although BART allows bicycles on its trains at certain times, and the Pittsburg/Bay Point BART Station offers bicycle parking, the station's access roadways do not provide designated bicycle facilities connecting the access points to the station entrance or bicycle parking area. Also, the one-way BART driveways furnishing access to West Leland Road can lead to circuitous routing for bicyclists or result in bicyclists using the adjacent sidewalks for contra-flow travel.

Pedestrian Facilities

Pedestrian access to the Pittsburg/Bay Point BART Station is currently restricted by physical barriers and fencing to three access points: the two BART station access road intersections on West Leland Road and the Bailey Road/SR 4 Eastbound Ramps intersection. Pedestrians from the Bay Point community typically access the station from Bailey Road, and pedestrians from Pittsburg typically access the station from West Leland Road.

The pedestrian facilities in the surrounding neighborhood are typical of a suburban environment. Most of the surrounding streets provide sidewalks, as shown on **Figure 4.4-5**. Sidewalks are not provided on the north side of West Leland Road west of the BART station where the adjacent land is currently vacant. Sidewalks are also not included on segments on the east side of Bailey Road. In addition, the sidewalks in the project vicinity lack street plantings and pedestrian-level lighting. Most of the sidewalks are located immediately adjacent to fast-moving travel lanes. High noise levels are most evident along sections of West Leland Road and Bailey Road (see Section 4.5, Noise, for consideration of project noise impacts, including those from transportation sources).

Crosswalks are provided at most intersections in the study area. However, many intersections along arterials have a marked crosswalk at only one approach across the arterial. For example, the signalized Bailey Road/SR 4 Eastbound Ramps/BART Driveway intersection does not include a crosswalk across the north approach of the intersection. The signalized intersections in the project vicinity also provide pedestrian signal heads and pedestrian push buttons.

The access points to the station are signalized, and all but one of the pedestrian crossings provides pedestrian signal control. At the Bailey Road/SR 4 Eastbound Ramps/BART driveway intersection, the exclusive southbound right turn lane on Bailey Road to the BART driveway is not signalized, but a marked crosswalk is present between the sidewalk and the “pork-chop” pedestrian-refuge island.

Pedestrians walking on Bailey Road under SR 4 are exposed to high noise levels and dark conditions because of the enclosed setting through the freeway underpass. The pedestrian path on the west side of Bailey Road requires pedestrians to walk out of the direct travel route to a pedestrian tunnel under a high-speed freeway off-ramp. The tunnel is not visible from the roadway, lacks lighting, and is subject to flooding. Most pedestrians bypass the tunnel and walk across the freeway off-ramp despite the signage prohibiting pedestrians from crossing there. On the east side of Bailey Road under SR 4, pedestrians are sandwiched between a vertical retaining wall and high-speed travel lanes on a 5-foot-wide sidewalk. Access to the BART entrance from the neighborhood north of SR 4 is limited to these pedestrian facilities along Bailey Road only.

Within the Pittsburg/Bay Point BART Station, sidewalks are provided along the north side of the BART access road between Bailey Road and the station, on both sides of the east BART entrance driveway, and along the east side of the west BART exit driveway. In addition, designated pedestrian routes within the parking lots guide pedestrians to the station.

Existing Traffic Operations

Level of Service Criteria

To measure and describe the operational status of a local roadway network, transportation engineers and planners commonly use a grading system called level of service (LOS). LOS is a description of a transportation facility’s operation, ranging from LOS A, indicating free-flow traffic conditions with little or no delay experienced by motorists, to LOS F, which describes congested conditions where traffic flows exceed design capacity, resulting in long queues and delays.

As required for compliance with the East Contra Costa County Action Plan, and the County’s Congestion Management and Growth Management programs, the analysis method outlined in the Technical Procedures update prepared by the Contra Costa Transportation Authority (CCTA) (2006), known as CCTALOS, was utilized to analyzed all signalized study intersections. To augment this analysis, the Transportation Research Board’s 2000 Highway Capacity Manual (HCM) method and Synchro software were also used to analyze intersection operations at both signalized and unsignalized study intersections. This type of supplemental analysis is explicitly allowed in CCTA's Technical Procedures, as the two methods are different in estimating intersection LOS.

For signalized intersections, only the CCTALOS based analysis is used herein to identify project impacts and determine mitigation measures, according to the requirements of the City. The HCM based analysis for signalized intersections is presented in **Appendix C** and is provided for informational purposes to provide supplementary analysis of traffic operations.

Signalized Intersections

At each signalized study intersection, traffic conditions were evaluated using the CCTALOS method. The CCTALOS planning-level analysis uses various intersection characteristics (i.e., traffic volumes, lane geometry, and signal phasing) to estimate the volume-to-capacity (V/C) ratio of an intersection. **Table 4.4-6** summarizes the relationship between the V/C ratio and LOS for signalized intersections.

Unsignalized Intersections

For unsignalized (side-street stop-controlled) intersections, the method outlined in Chapter 17 of the Transportation Research Board's 2000 HCM was used. This method estimates the worst-approach total delay (measured in seconds per vehicle) experienced by motorists traveling through an intersection. Total delay is defined as the amount of time required for a driver to stop at the back of the queue, move to the first-in-queue position, and depart from the queue into the intersection. **Table 4.4-7** summarizes the relationship between the delay and LOS for unsignalized intersections. Synchro software was used to calculate HCM-based LOS for unsignalized intersections.

Delay Index

The East Contra Costa Action Plan for Routes of Regional Significance (CCTA 2009c) establishes multi-modal traffic service objectives (MTSOs) for routes of regional significance in eastern Contra Costa County. The MTSO used to measure freeway operations is peak hour Delay Index, as calculated by the methods prescribed by the CCTA. Delay Index is defined as the ratio of the peak hour congested travel time to free-flow travel time on each roadway segment. For example, a Delay Index of 2.0 means that it takes twice as long to travel a particular segment during the peak commute hour than during non-commute hours when traffic moves at free-flow speeds.

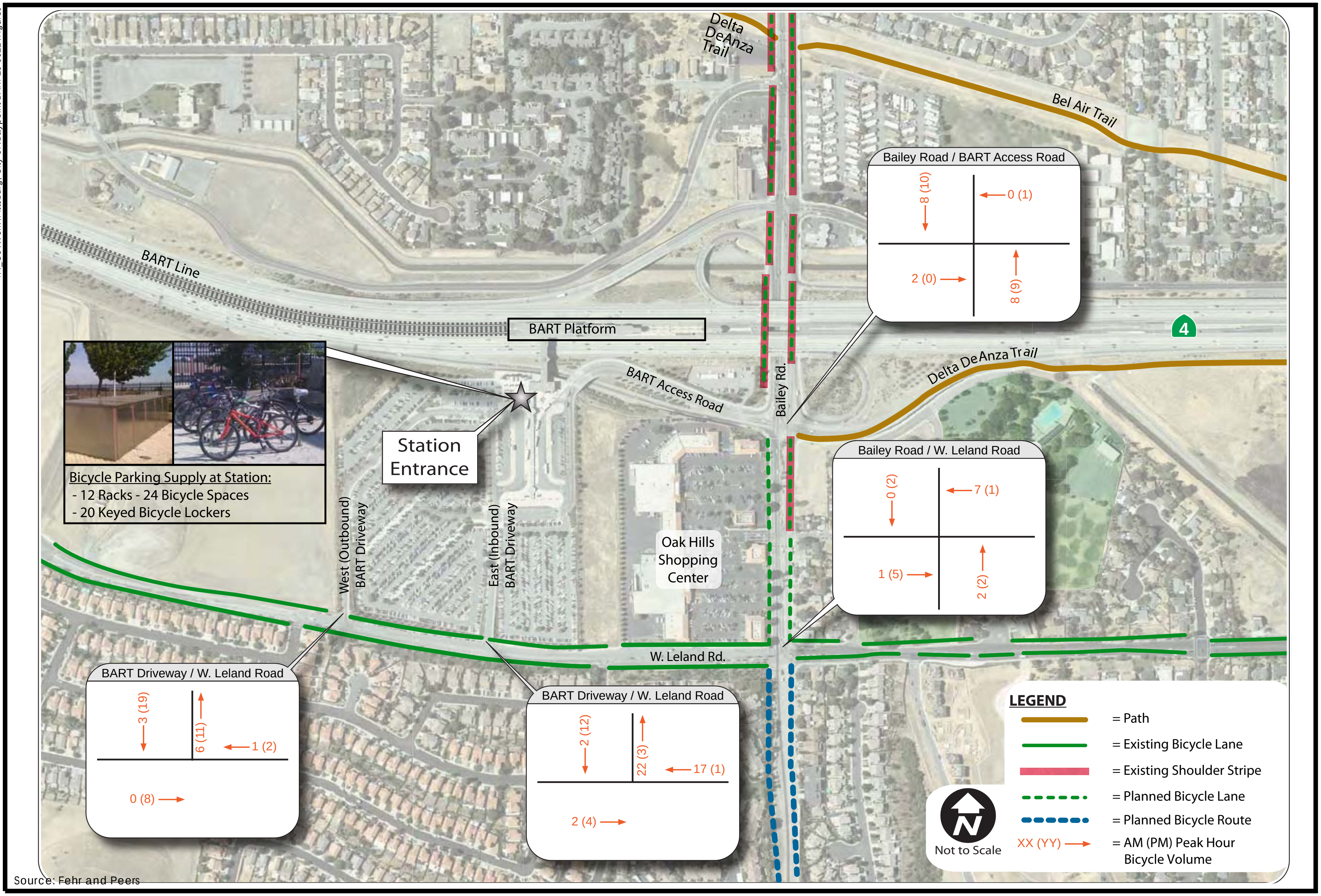

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Figure 4.4-4

Existing And Planned Bicycle Facilities

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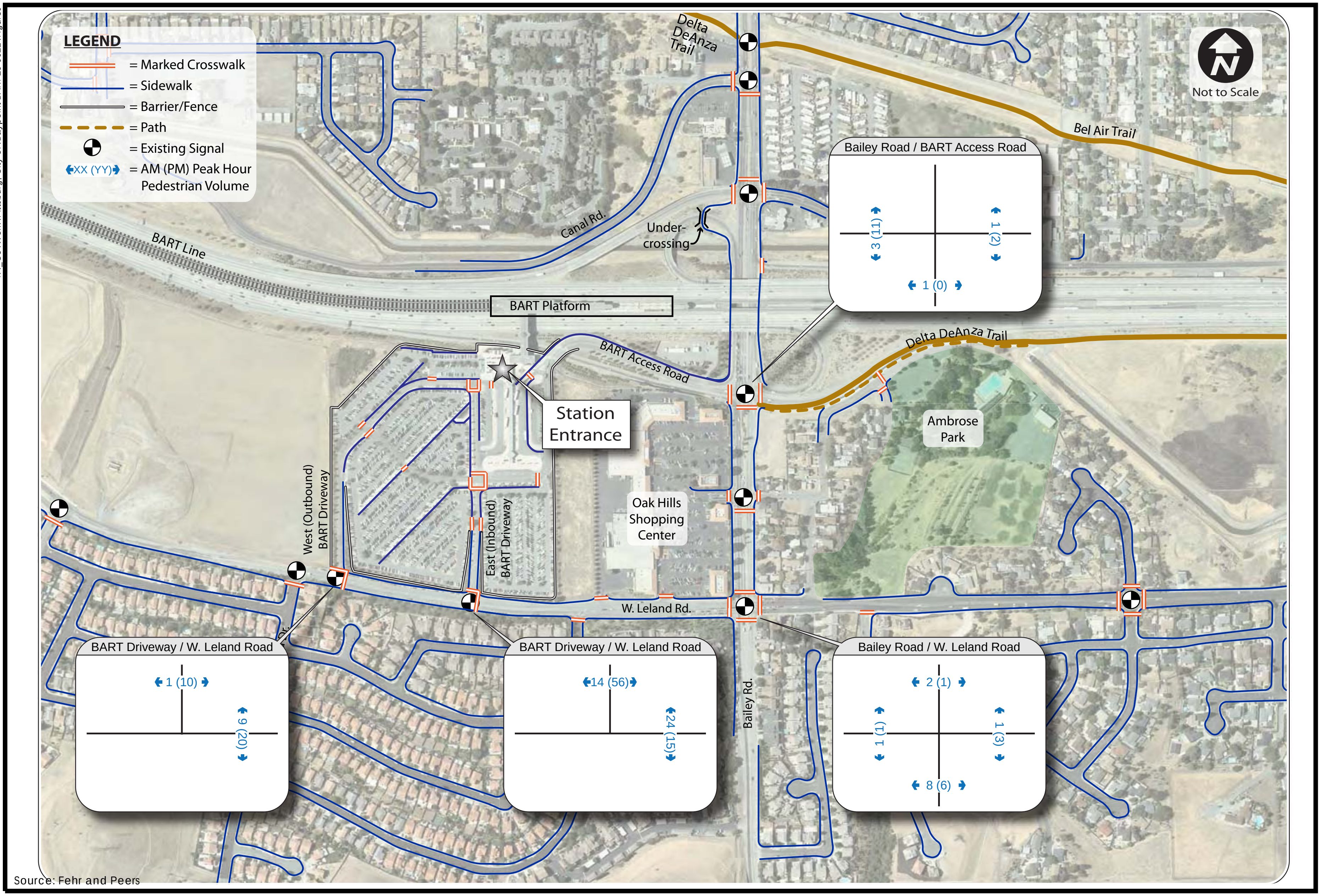

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Figure 4.4-5

Existing Off-Site Pedestrian Facilities

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Traffic Data Collection

Intersection turning movement counts were conducted in fall 2010 at the study intersections during the AM (7:00 to 9:00 AM) and PM (4:00 to 6:00 PM) peak periods. These counts were conducted on clear days with area schools in normal session (see **Appendix C**). For each count period, the single hour with the highest traffic volume was identified as the peak hour. **Figure 4.4-6a** and **4.4-6b** presents the intersection peak-hour volumes and shows the existing lane configurations at each study intersection.

Existing traffic volumes on SR 4 were determined from traffic data provided by the California Department of Transportation (Caltrans). The traffic counts indicate that the predominant travel direction on SR 4 is westbound during the AM peak hour and eastbound during the PM peak hour.

Existing Intersection Operations

Existing operations were evaluated for the weekday AM and PM peak hours at the study intersections, as summarized in **Table 4.4-8**. In addition to the traffic volume and intersection configuration and controls, the intersection operations analysis also accounts for the pedestrian and bicycle movements through the intersection.

All intersections currently operate at acceptable LOS (as defined in **Table 4.4-8**) during both AM and PM peak hours. Detailed LOS worksheets are provided in **Appendix C**.

TABLE 4.4-6
SIGNALIZED INTERSECTION LOS CRITERIA

LOS	CCTALOS Sum of Critical V/C Ratio	Description
A	< 0.60	Operations with very low delay occurring with favorable progression and/or short cycle length.
B	0.61 – 0.70	Operations with low delay occurring with good progression and/or short cycle lengths.
C	0.71 – 0.80	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.
D	0.81 – 0.90	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.
E	0.91 – 1.00	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.
F	> 1.00	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.

Source: CCTA 2006; Transportation Research Board 2000.

TABLE 4.4-7
UNSIGNALIZED INTERSECTION LOS CRITERIA

LOS	HCM Average Control Delay per Vehicle (seconds)	Description
A	≤ 10.0	No delay for stop-controlled approaches.
B	10.1 to 15.0	Operations with minor delay.
C	15.1 to 25.0	Operations with moderate delay.
D	25.1 to 35.0	Operations with long delays for some movements.
E	35.1 to 50.0	Operations with high delays and long queues.
F	> 50.0	Operations with extreme congestion, with very high delays and long queues.

Source: Transportation Research Board 2000.

TABLE 4.4-8
EXISTING CONDITIONS – INTERSECTION OPERATIONS SUMMARY

Study Intersection	Peak Hour	Traffic Control[1]	V/C Ratio or Delay2	LOS
San Marco Boulevard /SR 4 Eastbound Ramps	AM PM	Signal	0.39 0.45	A A
San Marco Boulevard/West Leland Road	AM PM	Signal	0.38 0.32	A A
West Leland Road/Alves Ranch Road	AM PM	Signal	0.39 0.22	A A
West Leland Road/Woodhill Drive	AM PM	Signal	0.39 0.25	A A
West Leland Road/ Southwood Drive	AM PM	Signal	0.42 0.30	A A
West Leland Road/West BART Driveway/A Street	AM PM	Signal	0.18 0.44	A A
West Leland Road/East BART Driveway/C Street	AM PM	Signal	0.30 0.27	A A
West Leland Road/Oak Hills Drive/D Street	AM PM	SSSC	3 (20) 3 (21)	A (C) A (C)
Bailey Road/Willow Pass Road	AM PM	Signal	0.46 0.58	A A
Bailey Road/SR 4 Eastbound On-ramp/Canal Road	AM PM	Signal	0.56 0.64	A B
Bailey Road/SR 4 Eastbound Ramps	AM PM	Signal	0.39 0.63	A B

Study Intersection	Peak Hour	Traffic Control[1]	V/C Ratio or Delay2	LOS
Bailey Road/Maylard Street/Shopping Center	AM PM	Signal	0.32 0.37	A A
Bailey Road/West Leland Road	AM PM	Signal	0.68 0.65	B B
West Leland Road/Chestnut Drive	AM PM	Signal	0.43 0.51	A A
Bailey Road/Myrtle Drive	AM PM	SSSC	4 (37) 1(12)	A (E) A (B)
Bailey Road/Concord Boulevard	AM PM	Signal	0.79 0.65	C B

Notes: Signal = signalized intersection; SSSC = side-street stop controlled intersection. For signalized intersections, CCTA volume to capacity (v/c) ratios and corresponding level of service based on Technical Procedures (CCTA 2006). For side-street stop-controlled intersections, delay is reported as intersection average (worst minor street approach) and corresponding LOS for unsignalized intersections based on Highway Capacity Manual (Transportation Research Board 2000)

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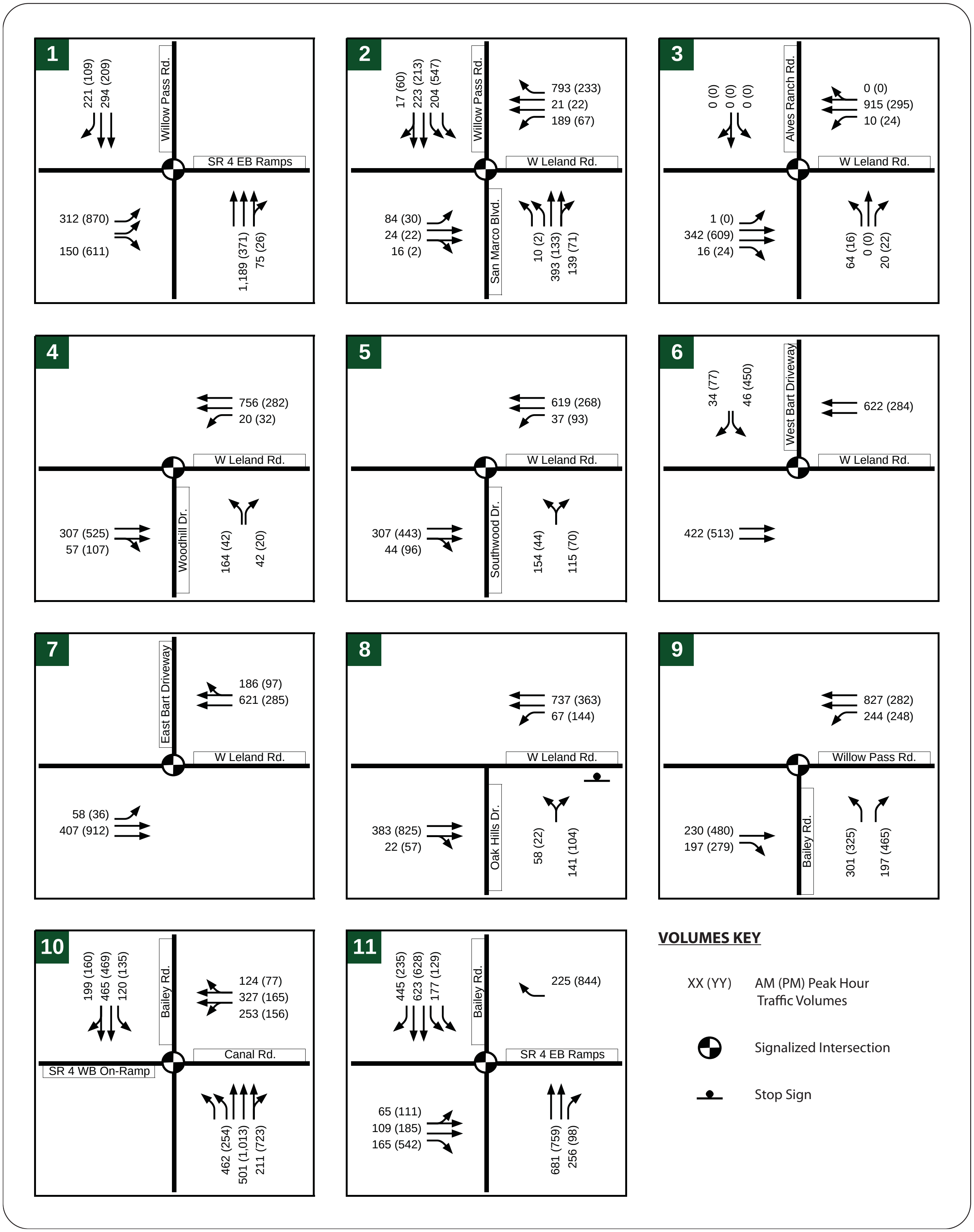
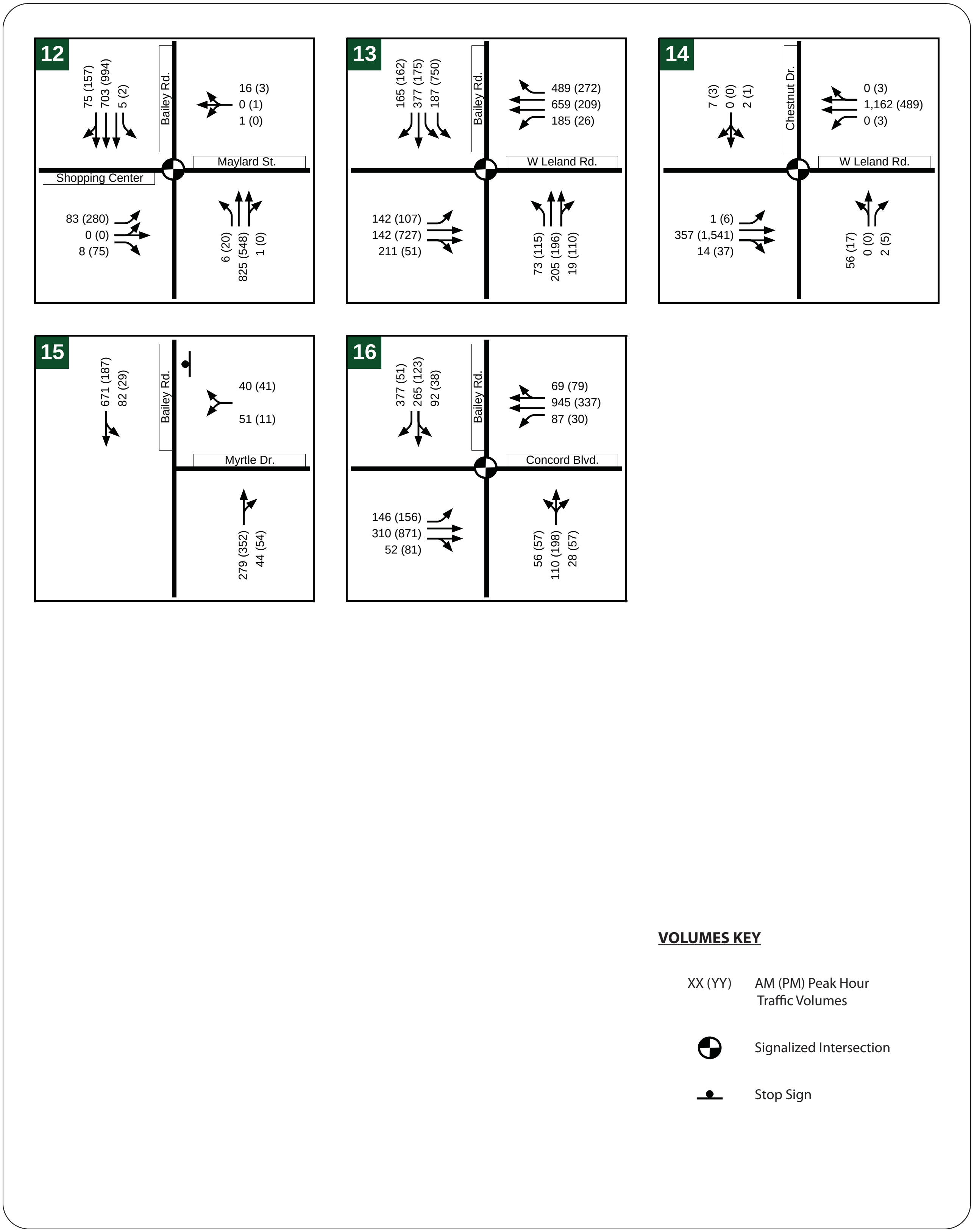


Source: Fehr and Peers

Figure 4.4-6A

Existing Conditions

Peak Hour Traffic Volumes, Lane Configurations And Traffic Control



Source: Fehr and Peers

Figure 4.4-6B

Existing Conditions

Peak Hour Traffic Volumes, Lane Configurations And Traffic Control

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Existing Freeway Operation

Freeway operations were evaluated using Delay Index calculations based on existing traffic volumes, the number of travel lanes, and the average calculated vehicle speeds using methods discussed under Methodology in this section. The existing freeway speeds and corresponding Delay Index are shown in **Table 4.4-9**. In the vicinity of the Master Plan area, SR 4 operates acceptably during both AM and PM peak hours. These operations have been confirmed by field observations. While poor operating conditions do occur on SR 4, the deficiencies occur east of the study area.

TABLE 4.4-9
EXISTING CONDITIONS – FREEWAY MAINLINE SPEEDS AND DELAY INDEX

Segment	Direction[1]	Delay Index	
		AM	PM
SR 4 (Between SR 242 and Bailey Road)	WB	1.1	1.8
	EB	1.2	1.1
SR 4 (Between Bailey Road and Loveridge Road)	WB	1.7	1.4
	EB	1.1	1.2

Source: CCTA, Final 2007 Traffic Service Objective Monitoring Report
Notes: [1]WB = westbound; EB = eastbound

4.4.2 REGULATORY FRAMEWORK

STATE

Caltrans

Caltrans owns, operates, and maintains State Route 4, which provides the primary access to eastern Contra Costa County, including the Master Plan area. Caltrans works with the Contra Costa Transportation Authority to monitor and implement improvements on SR 4.

REGIONAL

Contra Costa Transportation Authority (CCTA)

The first Contra Costa County Congestion Management Program (CMP) was adopted in 1991, and the program and has been updated every two years. The most recent update is the 2009 CMP (CCTA 2009a). The CMP is administered by the Contra Costa Transportation Authority and specifies that the transportation system within the county be monitored biennially for compliance with LOS standards. The LOS standard for the County CMP facilities has been set at LOS E for all roadways except those that were operating at LOS F when the first CMP was prepared. The CMP transportation system includes all of the state routes in the county and other Routes of Regional Significance.

The 2009 update of the Countywide Comprehensive Transportation Plan includes action plans for each subarea within Contra Costa County. These action plans include planned Multimodal Transportation Service Objectives (MTSOs) for Routes of Regional Significance.

East County Action Plan for Routes of Regional Significance

Adopted in August 2009, the East Contra Costa Action Plan for Routes of Regional Significance establishes the multimodal TSOs for routes of regional significance in eastern Contra Costa County. The MTSOs applicable to the proposed project are:

- **SR 4** – the Delay Index (DI) should not exceed 2.5 during the AM or PM peak hour
- **Bailey Road** – peak hour volume-to-capacity ratio at signalized intersections should not exceed 0.99 (LOS E), as calculated by the CCTALOS method
- **West Leland and Willow Pass roads** – peak hour volume-to-capacity ratio at signalized intersections should not exceed 0.85 (LOS D), as calculated by the CCTALOS method

BART Strategic Plan

BART adopted its Strategic Plan in October 2008. The document is organized under a set of broad implementation strategies, under which specific projects and programs are discussed with a list of desired outcomes. Strategies, projects, and outcomes in the BART Strategic Plan relevant to the Pittsburg/Bay Point BART Master Plan are listed below.

> **Implementation Strategy**: Station Access: Develop alliances with transit partners and the community to maximize connectivity and to facilitate multi-modal access including transit, bicycling and walking.
>
> Station Access Program: Develop a package of programs and projects to improve access to our stations by modes other than single occupant vehicles.
>
> *Desired Outcomes*:
>
> Depending on Station Profile Survey, develop plan by 2010 to meet or exceed Systemwide access targets specified in 2003 Station Access Guidelines.
>
> Establish station specific access targets by 2010.
>
> Implement 4 model access stations by 2010.
>
> **Station Wayfinding Program**: Implement wayfinding signage to and from BART stations and within the station to aid the customer in navigating the BART system and in making connections to other transit and local destinations.
>
> *Desired Outcomes*:
>
> Incorporate station signage improvements into Station Modernization Program.
>
> Implement a prototype signage improvement program by 2010.
>
> In collaboration with cities, develop and implement wayfinding signage directing customers to local BART stations, as funding becomes available.
>
> **Implementation Strategy**: System Expansion: Seek partnerships with other transit agencies, local communities and private entities to plan and implement cost-

effective, technology-appropriate service that demonstrates a commitment to transit-supportive growth and development and addresses the core needs of the system.

eBART Project: Expand BART rail service to eastern Contra Costa County.

Desired Outcomes:

Begin eBART revenue service by 2015.

Implementation Strategy: Transit-Oriented Development: Work with community partners to maximize support for Transit-Oriented Developments (TODs), to enhance the livability and vitality at our stations, and to support regional goals.

Station Planning Program: In cooperation with cities and local communities, conduct station planning to determine the appropriate level of development on and near BART station property. These plans will also include prioritized access improvements and funding plans.

Desired Outcomes:

Complete 6 station area plans by 2011.

TOD Station Development Program: Working with cities and local communities implement approved development projects.

Desired Outcomes:

Obtain development approvals at six station areas by 2013.

Complete construction of transit-oriented developments at eight BART stations by 2013.

LOCAL

City of Pittsburg General Plan

The General Plan serves as the overriding policy document in the City of Pittsburg. **Table 4.4-10** below provides a list of all applicable transportation and traffic policies and the proposed Master Plan's consistency with those goals and policies. While this DEIR analyzes the Master Plan's consistency with the General Plan pursuant to State CEQA Guidelines Section 15125(d), the Pittsburg City Council has the responsibility for ultimately determining the proposed Master Plan's consistency with the General Plan.

TABLE 4.4-10
PROJECT CONSISTENCY WITH APPLICABLE GENERAL PLAN TRANSPORTATION AND TRAFFIC POLICIES

General Plan Policies	Consistent with General Plan	Analysis
Policy 7-P-1 – Require mitigation for development proposals that are not part of the Traffic Mitigation Fee program which contribute more than one percent of the volume to an existing roadway or intersections with inadequate capacity to meet cumulative demand.	Yes, with Mitigation	The proposed project would make fair-share payments to identified improvement projects, should those projects be deemed feasible and a mechanism is developed to collect other fair share payments.
Policy 7-P-2 – Use the adopted Regional and Local Transportation Impact Mitigation Fee ordinances to ensure that all new development pays an equitable pro-rata share of the cost of transportation improvements. Review the Traffic Impact Mitigation Fee schedule annually and update every five years at a minimum.	Yes	The proposed project would be required to pay all applicable local and regional transportation fees.
Policy 7-P-10 –Require mitigation for development proposals which result in projected parking demand that would exceed the proposed parking supply on a regular and frequent basis.	Undetermined	Modeling of parking demand was conducted for the BART station and incorporated into the design of the Master Plan to ensure that parking is adequate for the needs of the station. As for the remainder of the Master Plan Area, as no specific development proposal has been designed, it cannot be determined if on-site parking would be adequate or if mitigation is required pursuant to this Policy. As such, this determination will be made by the City upon receipt of an actual development application in the future.
Policy 7-P-11 – Maximize the carrying capacity of arterial roadways by controlling the number of intersections and driveways, minimizing residential access, implementing Transportation Systems Management measures, and requiring sufficient on-site parking to meet the needs of each project.	Yes	The Master Plan Area does not contain any arterial roadways, nor would any be constructed.
Policy 7-P-26 – Require mitigation for development proposals which increase transit demand above the service levels provided by public transit operators and agencies.	Yes	No significant transit impacts were identified (see below).
Policy 7-P-27 – Support the expansion of the existing transit service area and an increase in the service levels of existing transit. Support increased Tri-Delta and County Connection express bus service to the Pittsburg/Bay Point BART Station to reduce traffic demand on State Route 4.	Yes	The Master Plan includes policies and design principles that are supportive of increased transit service to the area. The Master Plan would not preclude increased bus service.
Policy 7-P-28 – Encourage the extension of BART to Railroad Avenue within the median of State Route 4. Cooperate with BART and regional agencies to develop station area plans and transit-oriented development patterns.	Yes	Construction of the Master Plan would not preclude extension of BART to Railroad Avenue.

General Plan Policies	Consistent with General Plan	Analysis
Policy 7-P-29 – Preserve options for future transit use when designing improvements for roadways. Ensure that developers provide bus turnouts and/or shelters, where appropriate, as part of projects.	Yes	The Master Plan provides for a bus-only street with designated bus loading areas with amenities for bus riders. The Master Plan also includes policies and design principles that encourage increased transit usage.
Policy 7-P-30 – Work with Tri-Delta and planning area residents to plan for local bus routes that more effectively serve potential riders within local neighborhoods.	Yes	Throughout the planning process, City staff and the consultant team met several times with representatives from Tri-Delta to garner comments on the proposed Master Plan. The Master Plan's Access/Accessibility Plan includes recommendations to improve transit service in the local neighborhoods.
Policy 7-P-31 – Work with Tri-Delta and County Connection to schedule signal timing for arterials with heavy bus traffic, where air quality benefits can be demonstrated.	Yes	The proposed Master Plan does not include any arterials.
Policy 7-P-33 – Require mitigation for development proposals which result in potential conflicts, or fail to provide adequate access, for pedestrians and bicycles.	Yes	The Master Plan contains policies and design principles that encourage and improve safety of pedestrian and bicycle travel.
Policy 7-P-34 – As part of development approval, ensure that safe and contiguous routes for pedestrians and bicyclists are provided within new development projects and on any roadways that are impacted as a result of new development.	Yes	The Master Plan provides for pedestrian and bicycle circulation and access within the project area and connections to adjacent neighborhoods.
Policy 7-P-36 – Ensure continued compliance with Title 24 of the Uniform Building Code, requiring removal of all barriers to disabled persons on arterial and collector streets.	Yes	The Master Plan's Access/Accessibility Plan provides design guidelines to accommodate disabled persons.
Policy 7-P-38 – Develop a series of continuous pedestrian systems within Downtown and residential neighborhoods, connecting major activity centers and trails with City and County open space areas.	Yes	The Master Plan provides non-motorized connections to adjacent residential and commercial uses and trails.
Policy 7-P-39 – Ensure that residential and commercial developments provide pedestrian pathways between lots for direct routes to commercial centers, schools, and transit facilities.	Yes	The Master Plan provides non-motorized connections to adjacent residential and commercial uses and trails.
Policy 7-P-40 – Ensure provision of sufficiently wide sidewalks and pedestrian paths in all new residential development.	Yes	The Master Plan includes design guidelines for sidewalks to accommodate the expected demand.
Policy 7-P-42 – Improve pedestrian crossing safety at heavily used intersections by installing crossing controls that provide adequate time for pedestrians to cross the street.	Yes	New signalized intersections proposed as part of the Master Plan will be designed to provide adequate pedestrian crossing time. In addition, signal timings at study intersections that would be mitigated would provide adequate pedestrian crossing times.

General Plan Policies	Consistent with General Plan	Analysis
Policy 7-P-43 – Provide adequate roadway width dedications for bicycle lanes, paths, and routes as designated in Figure 7-4 of the General Plan.	Yes	The Master Plan would provide dedicated bicycle facilities within the Master Plan area. The project would not preclude the construction of planned bicycle facilities.
Policy 7-P-45 – During review of development projects, encourage secure bicycle facilities and other alternative transportation facilities at employment sites, public facilities, and multi-family residential complexes.	Yes	The Master Plan and Access/Accessibility Plan include guidelines on bicycle parking.
Policy 7-P-46 – Construction or expansion of roadways and intersections within the City shall not result in the severance of an existing bicycle route, unless an alternative exists or is provided.	Yes	Neither the Master Plan nor mitigation measures in this DEIR would eliminate any existing bicycle facilities.
Policy 7-P-48 – Ensure that construction of bulb-outs and curb extensions at intersections for pedestrian safety does not endanger bicyclists by forcing them into traffic lanes.	Yes	The Master Plan includes design guidelines on bulb-outs and other pedestrian amenities that would not interfere with bicycle circulation.
Policy 7-P-52 – Require that new arterial and collector streets accommodate bicyclists.	Yes	The Master Plan provides dedicated bicycle facilities on collector streets within the project area.
Policy 7-P-56 – Favor Transportation Demand Management programs that limit vehicle use over those that extend the commute hour.	Yes	The Master Plan's Access/Accessibility Plan includes Transportation Demand Management (TDM) strategies to reduce auto dependence for project residents, employees, and visitors.
Policy 7-P-57 – During review of development plans, encourage major employers to establish designated carpool parking areas and secure bicycle facilities in preferable on-site locations (for example, under parking shelters or closest to main entryways).	Yes	The Master Plan and Access/Accessibility Plan include guidelines for amenities for non-automobile travel including carpools and bicycle parking.
Policy 7-P-58 – Allow the reduction of transportation impact fees on new non-residential development commensurate with provision of Transportation Demand Management measures.	Yes	The proposed Master Plan would be able to benefit from this reduction.

City of Concord General Plan

The City of Concord borders the Pittsburg area to the south. Two of the study intersections evaluated in this DEIR are located in Concord. The Growth Management and Transportation and Circulation Elements of the Concord 2030 Urban Area General Plan (City of Concord, 2007) include the following policies pertinent to consideration of the proposed project:

> Policy GM-1.3.1 – The following standards apply to signalized intersections on Basic Routes (all roads not indicated as Routes of Regional Significance):
>
> - Rural – LOS low C (V/C ratio 0.70 to 0.74)
> - Semi-Rural – LOS high C (V/C ratio 0.75 to 0.79)

- Suburban – LOS low D (V/C ratio 0.80 to 0.84)
- Urban – LOS high D (V/C ratio 0.85 to 0.89)
- Downtown (CBD) – LOS low E (V/C ratio 0.90 to 0.94)

The above classifications refer to areas of the community rather than specific streets or intersections. Thus, for the study intersections in City of Concord, this DEIR uses the following significance thresholds recently used by City of Concord for the Concord Community Reuse Plan Draft Revised Environmental Impact Report (City of Concord 2010):

- Bailey Road/Myrtle Road – LOS D (V/C ratio 0.90)
- Bailey Road/Concord Boulevard – LOS E (V/C ratio 0.99)

4.4.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The impact analysis provided below is based on the following State CEQA Guidelines Appendix G. An impact is considered significant if the project would:

- Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.
- Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways.
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Result in inadequate emergency access.
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

According to the Initial Study for the proposed Master Plan, released by the City concurrently with the Notice of Preparation on December 7, 2010, no impact related to changes in air traffic patterns was expected due to the distance between the Master Plan area and any controlled airports. Therefore, pursuant to State CEQA Guidelines Section 15128, this impact will not be discussed herein.

Significance Criteria for Traffic Operations

Level of service (LOS) criteria differs for intersections in the study area, depending on the jurisdiction that has control over the intersection or a different LOS standard indicated in an adopted plan or policy. **Table 4.4-11** presents the LOS standard for each study intersection.

TABLE 4.4-11
INTERSECTION STANDARDS - PITTSBURG/BAY POINT BART TRAFFIC IMPACT STUDY AREA

Intersections	Jurisdiction	Standard
1) San Marco Boulevard /SR 4 Eastbound Ramps	Caltrans	LOS D – V/C ≥ 0.90
2) San Marco Boulevard/West Leland Road	CCTA CMP1	LOS mid D – V/C ≥ 0.85
3) West Leland Road/Alves Ranch Road	CCTA CMP	LOS mid D – V/C ≥ 0.85
4) West Leland Road/Woodhill Drive	CCTA CMP	LOS mid D – V/C ≥ 0.85
5) West Leland Road/Southwood Drive	CCTA CMP	LOS mid D – V/C ≥ 0.85
6) West Leland Road/West BART Driveway/A Street	CCTA CMP	LOS mid D – V/C ≥ 0.85
7) West Leland Road/East BART Driveway/C Street	CCTA CMP	LOS mid D – V/C ≥ 0.85
8) West Leland Road/Oak Hills Drive/D Street	CCTA CMP	LOS mid D – V/C ≥ 0.85
9) Bailey Road/Willow Pass Road	CCTA CMP	LOS mid D – V/C ≥ 0.85
10) Bailey Road/SR 4 Eastbound On-ramp/Canal Road	CCTA CMP	LOS E – V/C ≥ 0.99
11) Bailey Road/SR 4 Eastbound Ramps	CCTA CMP	LOS E – V/C ≥ 0.99
12) Bailey Road/Maylard Street/Shopping Center	CCTA CMP	LOS E – V/C ≥ 0.99
13) Bailey Road/West Leland Road	CCTA CMP	LOS E – V/C ≥ 0.99
14) West Leland Road/Chestnut Drive	CCTA CMP	LOS mid D – V/C ≥ 0.85
15) Bailey Road/Myrtle Drive	Concord	LOS D – V/C ≥ 0.90
16) Bailey Road/Concord Boulevard	Concord	LOS E – V/C ≥ 0.99

Note: CCTA CMP = Contra Costa Transportation Authority Congestion Management Program, TRANSPLAN's East County Action Plan and Pittsburg General Plan.

Based on the adopted policies of CCTA and the cities of Pittsburg and Concord, a significant traffic impact would occur if the addition of project-generated traffic would result in any of the effects listed below:

- Operations of a signalized study intersection to decline from an acceptable level to an unacceptable level (as defined in **Table 4.4-11**)
- Deterioration in already unacceptable operations at a signalized intersection by a change in V/C ratio of more than 0.01
- Operations of an unsignalized study intersection to decline from an acceptable level to an unacceptable level, and the need for installation of a traffic signal at an unsignalized intersection, based on the Manual on Uniform Traffic Control Devices (MUTCD) Peak Hour Signal Warrant (Warrant 3)

East County Action Plan MTSOs

TRANSPLAN has established MTSO's in the East Contra Costa Action Plan for Routes of Regional Significance. **Table 4.4-11** summarizes the applicable MTSO standards for study intersections. In addition, TRANSPLAN has also established a Delay Index of 2.5 for SR 4 freeway. A significant impact would occur if the addition of project-generated traffic would result in the following:

- Operations of a freeway segment to exceed the established Delay Index standard of 2.5
- Deterioration in a freeway segment that already exceeds the established Delay Index standard by increasing the roadway volume by more than 1 percent

Additional Significance Criteria

Transit load is not part of the permanent physical environment; transit service changes over time as people change their travel patterns. Therefore, the effect of the proposed project on transit ridership need not be considered a significant environmental impact under CEQA unless it would cause significant secondary effects, such as causing the construction of new permanent transit facilities which in turn causes physical effects on the environment. Furthermore, an increase in transit ridership is an environmental benefit, not an impact as it results in overall reduced emissions and vehicle trips on roadways. Regardless, the proposed Master Plan's impact on transit ridership is included in this EIR.

This document evaluates whether the project would affect any of the following:

- 90 percent of buses do not arrive within five minutes of schedule
- Buses are ahead of schedule
- Bus Productivity – Decrease below a minimum of 15 passengers per hour
- Increase the peak hour average ridership on BART by 3 percent where the passenger volume would exceed the standing capacity of BART trains
- Increase the peak hour average ridership at a BART station by 3 percent where average waiting time at fare gates would exceed one minute
- Project-related traffic congestion would substantially increase travel times for public transit

A significant pedestrian impact would result if the proposed project would cause substantial overcrowding on public sidewalks, creation of hazardous conditions for pedestrians, or elimination of pedestrian access to adjoining areas. The project would have a significant effect on bicyclists if it would create particularly hazardous conditions for bicyclists or eliminate bicycle access to the adjoining areas. And, if the project were to impede implementation of a planned pedestrian or bicycle pathway, or if the development would conflict with adopted policies supporting alterative transportation, a significant pedestrian or bicycle impact would be identified.

METHODOLOGY

Analysis Scenarios

The following scenarios were evaluated for this study:

- **Existing** – Represents existing (2010) conditions with volumes obtained from recent traffic counts. Under the existing scenario, the Master Plan area is assumed to exist in its current state (with the West Coast Home Builders [WCHB] site unimproved and the BART property containing the parking and access it does now).
- **Existing Plus Project** – Existing conditions plus project-related traffic.
- **Cumulative (2035) No Project** – Future 2035 forecast conditions, taking into account buildout of the City of Pittsburg and surrounding jurisdictions but no new development or redevelopment of the Master Plan area.
- **Cumulative (2035) Plus Project** – Future 2035 forecast conditions, as determined in the Future 2035 No Project scenario, plus project-related traffic.

Project Characteristics

The proposed Master Plan would provide a mixed-use transit-oriented development in an area currently occupied by parking lots for the Pittsburg/Bay Point BART Station or vacant land. As discussed in Section 4.0, Assumptions, the Master Plan is expected to result in development of 1,168 multi-family dwelling units, about 45,302 square feet of ground-floor retail, and about 101,059 square feet of flex space that could be used as residential, retail/commercial, office, or quasi-public space. In addition, all 2,000 existing surface parking spaces at the BART station would be consolidated into two parking garages, which will also provide additional spaces to serve the nonresidential uses in the Master Plan area.

In addition, the proposed project would continue to provide a bus transit center adjacent to the BART station, serving buses operated by Tri Delta Transit. The Master Plan is designed to encourage walking for trips within the Master Plan area, and it also provides for non-motorized connections to adjacent neighborhoods and the regional Delta de Anza Trail. Vehicular access for the project would continue to be provided by roadways connecting to Bailey and West Leland roads.

As part of the Master Plan process for the project, an Access/Accessibility Plan has also been prepared as part of the Master Plan. The Access/Accessibility Plan was developed to improve access to and from the BART station and the Master Plan area for all travel modes, focusing on improving and encouraging alternatives to the drive-alone mode (i.e., walk, bike, bus).

Project Trip Generation

Trip generation for the project includes trips related to the residential, commercial, and office components of the Master Plan. Research has shown that transit-oriented developments typically generate fewer vehicle trips than conventional developments separate from transit stations. Vehicle trips from transit-oriented developments can be reduced due to transit usage, complementary land uses in a high-density area, and utilization of uses by those patrons already using transit at the site. The trip generation calculations for the Master Plan have been adjusted to account for the project's transit-oriented location and mixture of uses as described below (see notes under **Table 4.4-12** for more information).

Institute of Transportation Engineers' (ITE) Trip Generation

The initial project trip generation (before reductions for transit-oriented location and other factors) was estimated using Trip Generation, 8th Edition (ITE 2008). The ITE trip generation rates are generally based on data collected at sites across the country, most of which are stand-alone sites in suburban settings with minimal transit access. **Table 4.4-12** presents the initial trip generation estimates for the different land uses in the Master Plan area. The quasi-public land use may consist of government offices or educational or cultural uses that serve the community such as job training facilities, community centers, a post office outlet, or extended learning campuses. For the purposes of this trip generation estimate, the quasi-public land use was assumed to be most closely similar to an office use. Based on the ITE methodology, the proposed project is estimated to generate approximately 14,730 daily trips, including 850 in the AM peak hour and 1,492 in the PM peak hour. To estimate how many of these trips could be expected to occur via alternative modes of travel, numerous sources of information were reviewed, as discussed below in detail.

TABLE 4.4-12
PITTSBURG/BAY POINT BART MASTER PLAN TRIP GENERATION

Description	Land Use	Units	Daily Total	Weekday AM Peak Hour			Weekday PM Peak Hour		
				In	Out	Total	In	Out	Total
Multi-Family	Apartment[1]	1,168 DU	7,200	115	461	576	429	231	660
Commercial	Shopping Center[2]	95.83 ksf	6,610	92	58	150	303	315	618
Office	Office[3]	34.36 ksf	590	70	10	80	20	97	117
Quasi-Public	Office[3]	16.17 ksf	330	38	6	44	16	81	97
Initial ITE Project Trips			**14,730**	**315**	**535**	**850**	**768**	**724**	**1,492**
BART Trips[4]			(1,620)	(5)	(160)	(165)	(135)	(37)	(172)
Mixed Use Reductions[5]			(1,820)	(38)	(65)	(103)	(93)	(88)	(181)
Commercial Transit Reduction[6]			(330)	(3)	(5)	(8)	(16)	(15)	(31)
Total Trip Reduction			**(3,770)**	**(46)**	**(230)**	**(276)**	**(244)**	**(140)**	**(384)**
Net New Project Trips			**10,960**	**269**	**305**	**574**	**524**	**584**	**1,108**

Source: ITE 2008;
Notes: du = dwelling unit; ksf = 1,000 square feet
[1]Trip generation based on equations for Apartment (Land Use 220) in the Institute of Transportation Engineers' (ITE) Trip Generation 2008), as presented below.
Daily: (T) = 6.06 (X) + 123.56 (50% entering, 50% exiting)
AM: (T) = 0.49 (X) + 3.73 (20% entering, 80% exiting)
PM: (T) = 0.55 (X) + 17.65 (65% entering, 35% exiting)
Where X = dwelling units, T = number of vehicle trips
[2]Trip generation based on equations for Shopping Center (Land Use 820) in the ITE Trip Generation (2008), as presented below
*Daily: Ln(T) = 0.65*Ln(X) + 5.83 (50% entering, 50% exiting)*
*AM: Ln(T) = 0.59*Ln(X) + 2.32 (61% entering, 39% exiting)*
*PM: Ln(T) = 0.67*Ln(X) + 3.37 (49% entering, 51% exiting)*
Where X = 1,000-square feet of floor area, T = number of vehicle trips
[3]Trip generation based on equations for General Office (Land Use 710) in the ITE Trip Generation (2008), as presented below
*Daily: Ln(T) = 0.77*Ln(X) + 3.65 (50% entering, 50% exiting)*

*AM: Ln(T) = 0.80*Ln(X) + 1.55 (88% entering, 12% exiting)*
PM: (T) = 1.12(X) + 78.81 (17% entering, 83% exiting)*
Where X = 1,000-square feet of floor area, T = number of vehicle trips
[4]Based on BART Direct Ridership Model (DRM)
[5]Based on Mixed-Use Development (MXD) Model, internal trips, external walking/biking trips and bus transit trips
[6]Commercial transit reduction based on TOD literature on commercial trips, including Travel Characteristics of Transit-Oriented Development in California (Lund et al. 2004), and Ridership Impacts of Transit-Focused Development in California (Cervero 1994).

In 2008–2009, as part of BART's Demand Management Strategy program, Fehr & Peers developed a Direct Ridership Model (DRM) to provide a precise, quick-response rail ridership forecast for BART stations. The DRM is directly and quantitatively responsive to land use and transit access characteristics within the immediate areas of existing transit stations, responding directly to factors such as parking supply, feeder bus service levels, and station-area households and employment to estimate BART ridership and the number of patrons arriving and departing by each available mode of access during various time periods throughout the day.

For these estimates, Fehr & Peers applied the DRM to the Pittsburg/Bay Point BART Station in the 2030 forecast year, both with and without the proposed Pittsburg/Bay Point BART Master Plan, while keeping all other variables constant, and obtained estimates for daily, AM peak hour, and PM peak hour ridership. Due to the proximity of the project to the BART station, it is assumed that all new BART patrons generated by the project would use non-auto modes (walk, bike) to access the station.

The BART DRM model estimated that the Master Plan area would generate approximately 1,620 daily BART trips, including 165 in the AM peak hour and 172 in the PM peak hour. It was assumed that these represent trips that would be shifted from driving to using BART; therefore, these BART trips were deducted from the initial vehicle trip generation estimates for the project.

Mixed-Use Development Model

In 2008–2009, Fehr & Peers led a national research project for the Environmental Protection Agency (EPA) and ITE to develop a quantitative model that captured the traffic benefits of mixed-use developments. The research, using household travel surveys and GIS databases from six metropolitan regions and over 200 mixed-use developments, shows that the primary factors associated with reductions in automobile travel from mixed-use sites are:

- The total and relative amounts of population and employment on the site;
- The site density;
- The size of households on site and their auto ownership patterns;
- The amount of employment within walking distance of the site;
- The pedestrian-friendliness (block sizes, presence of sidewalks) of the site; and
- The density of bus stops, presence or absence of a rail station, and the access to employment within a 30-minute transit ride of the site.

The mixed-use development (MXD) model estimates the probabilities that a trip would be captured internally among complementary uses, would be a walking trip from/to employment within 1 mile of the site, or would be a transit trip from/to employment within a 30-minute transit ride of the site. Adjustments were made to the MXD model results to exclude BART trips to avoid double-counting the BART trips already captured by the DRM model described above.

The MXD model estimates a reduction of approximately 1,820 daily vehicle trips, including 103 in the AM peak hour and 181 in the PM peak hour. These trips would no longer be vehicle trips that would leave the site, but would instead shift to walking, biking, or trips by other modes that would remain internal or very close to the project site.

Commercial Transit Reduction

Literature on mode share for trips to transit-oriented retail locations shows a range from 5 percent to over 20 percent transit share for shoppers and up to 40 percent transit share for retail employees, depending on the size of the retail center, its location, the transit service, and parking availability. Considering that the retail use proposed for the Pittsburg/Bay Point BART Master Plan is relatively small and neighborhood-serving, some of the patrons are likely to be BART riders or adjacent housing residents, who would combine the retail trip with their commute trip. Mode share reductions for direct project trips via BART and bus transit have already been accounted for in the above DRM and MXD methodologies. In addition to these reductions, a 5 percent reduction was applied to only the commercial trip generation to account for pass-by trips from BART riders and adjacent housing residents. This results in approximately 330 daily trips (including eight AM peak hour and 31 PM peak hour trips) that are classified as commercial pass-by trips.

Trip Generation Summary

Table 4.4-12 summarizes the proposed project's vehicle trip generation. Based on the reductions described above, the project would generate approximately 10,960 new daily vehicle trips, including 574 in the AM peak hour and 1,108 in the PM peak hour. This represents a 26 percent reduction in daily trips, a 32 percent reduction in AM peak hour trips, and a 26 percent reduction in PM peak hour trips compared to the initial ITE-based estimates.

This EIR assumes that the Pittsburg/Bay Point BART Station would continue to provide the same amount of parking supply for BART commuters. While parking adequacy is not considered a potential impact under CEQA, if the BART Station parking supply is reduced, fewer vehicles would travel to and from the Station, reducing the overall trips generated by the proposed Master Plan. This EIR presents a conservative worst-case analysis by assuming that the BART Station would continue to provide the current parking supply after the completion of the proposed Master Plan.

Trip Distribution and Assignment

Trip distribution is defined as the directions of approach and departure that vehicles would use to arrive at and depart from the site. The Master Plan's trip distribution was estimated based on the results of the Contra Costa Transportation Authority (CCTA) Travel Demand Model, nearby complementary land uses, and existing and future travel patterns. Different trip distribution percentages were computed for residential, office, and commercial land uses to reflect the fact that these uses draw patrons from different areas.

Figure 4.4-7 presents the project trip distribution, and **Figure 4.4-8** presents the project trip assignment at the study intersections. Trips from the residential components of the project would mostly be destined for the employment centers in central Contra Costa County. The office components of the project would mostly draw employees and patrons from the residential centers in eastern Contra Costa County. The commercial components of the project would mostly serve the local neighborhoods.

PROJECT IMPACTS AND MITIGATION MEASURES

Increase in Project-Related Traffic

Impact 4.4.1 Development of the proposed Master Plan would not exceed a level of service standard established by the City of Pittsburg, CCTA, or Caltrans for some designated roads or highways. This impact is considered **less than significant**.

Intersection Operations

Master Plan trips were added to the existing traffic volumes at the study intersections and existing BART trips were reassigned to the roadway network to reflect the expected changes in travel to the Master Plan area with the proposed on-site changes. **Figure 4.4-9** shows the resulting traffic forecasts. The lane configurations and traffic controls are not expected to change, except at intersections of A and C streets with West Leland Road, which would become full-access intersections with the proposed project. Tables 4.4-13 summarize the results of the traffic impact analysis. The Existing Plus Project condition is not expected to impact any study intersections. Therefore, this impact would be **less than significant**.

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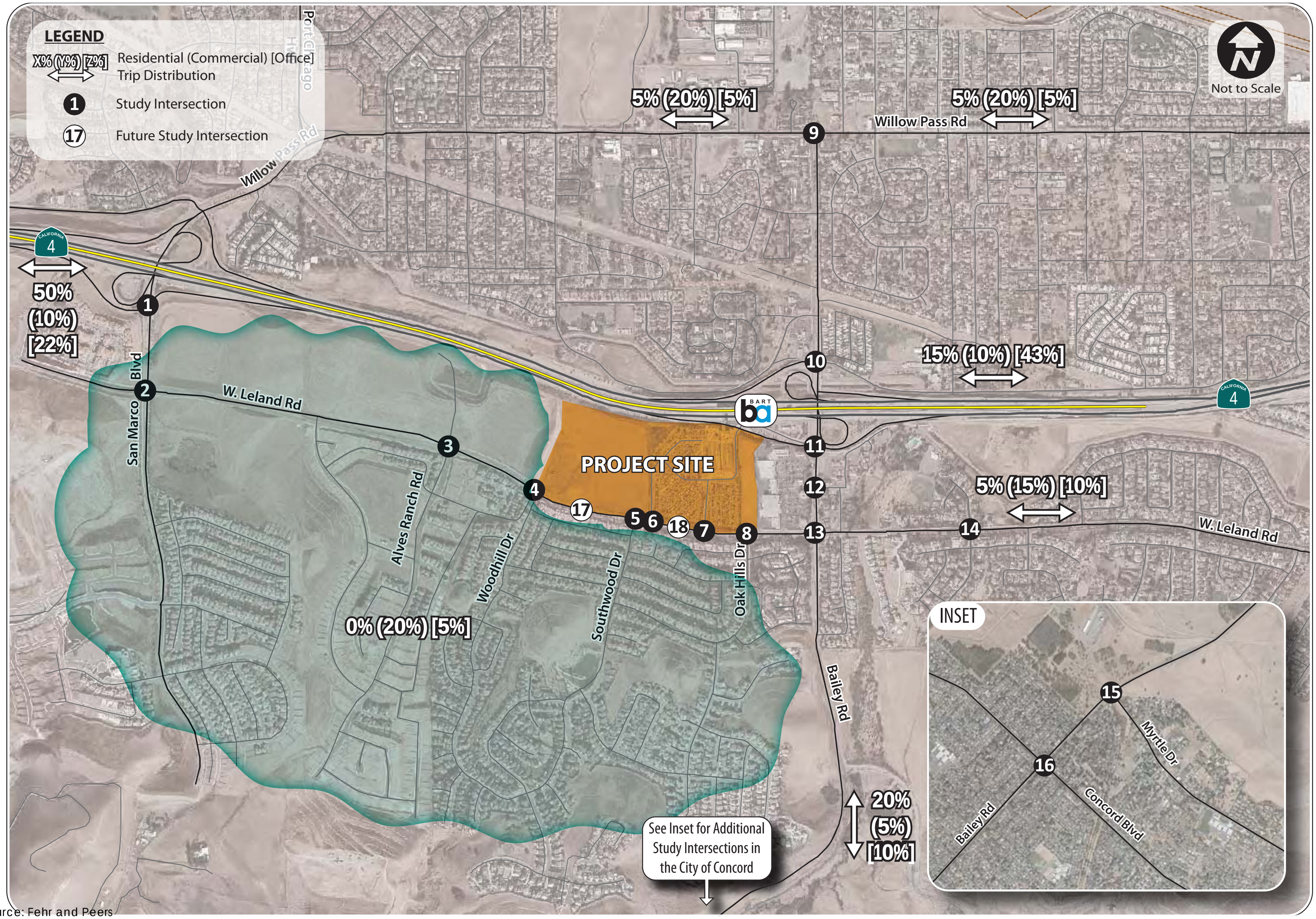

Source: Fehr and Peers

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Figure 4.4-7
Project Trip Distribution

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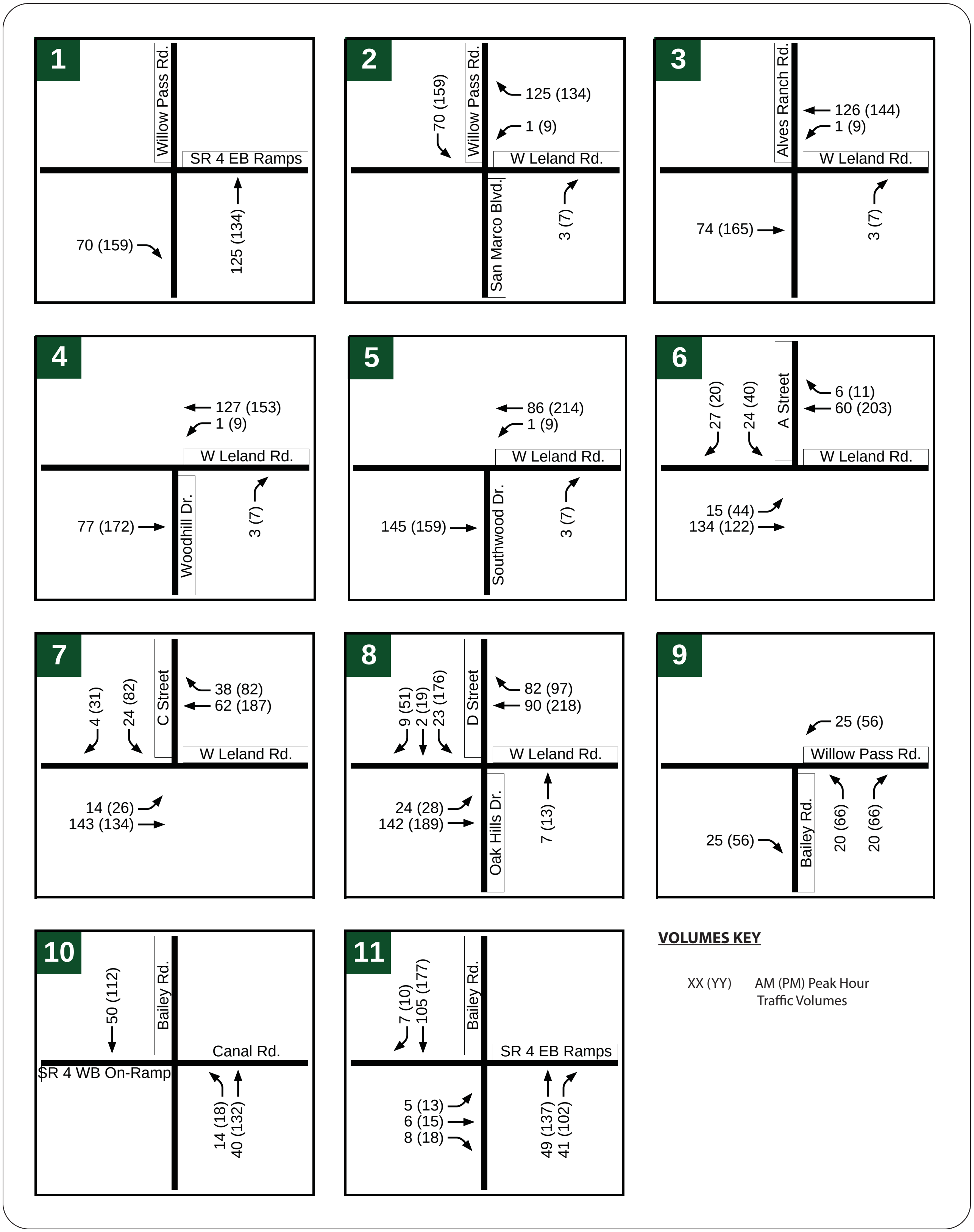

Source: Fehr and Peers

Figure 4.4-8A

Project Trip Assignment

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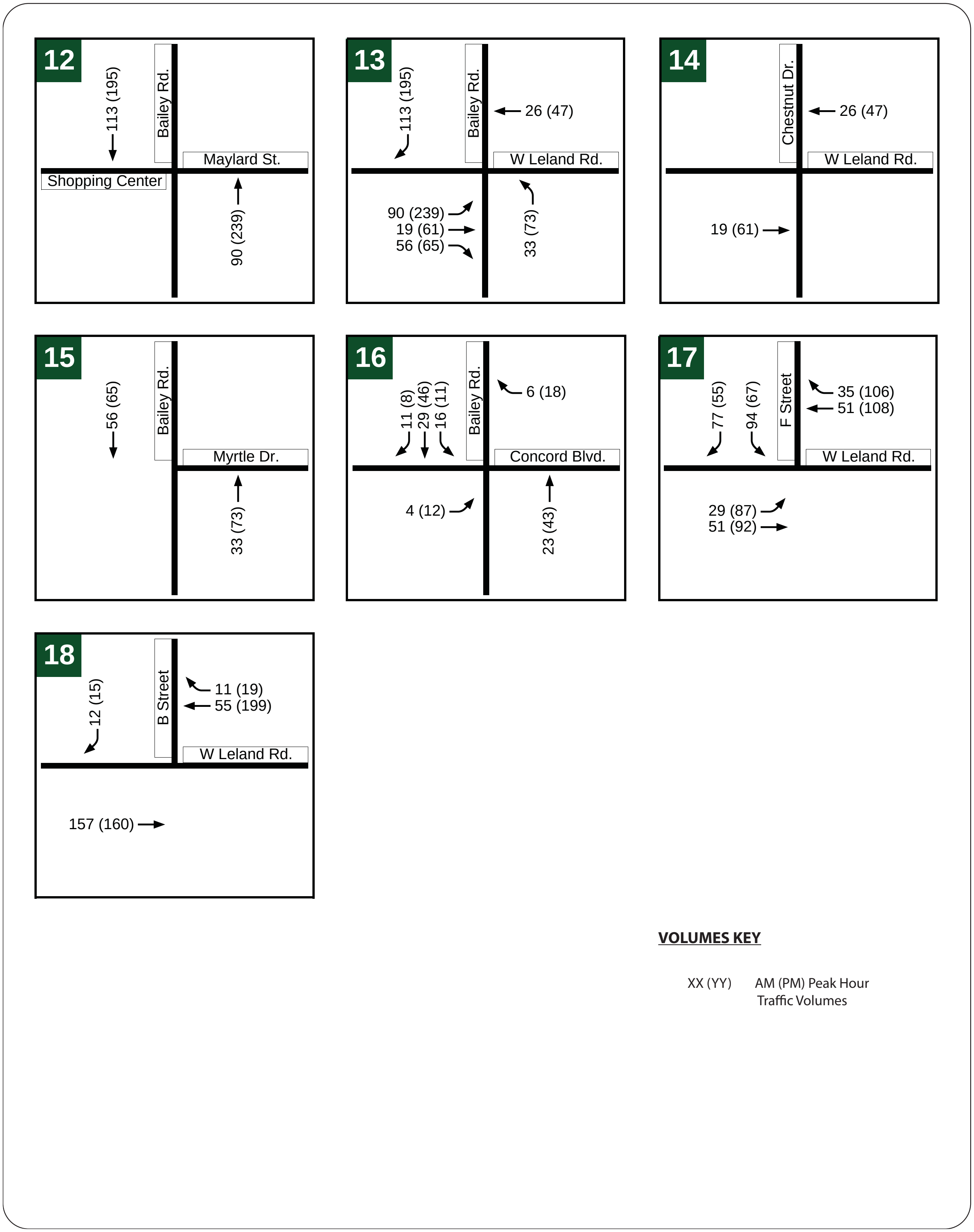

Source: Fehr and Peers

Figure 4.4-8B

Project Trip Assignment

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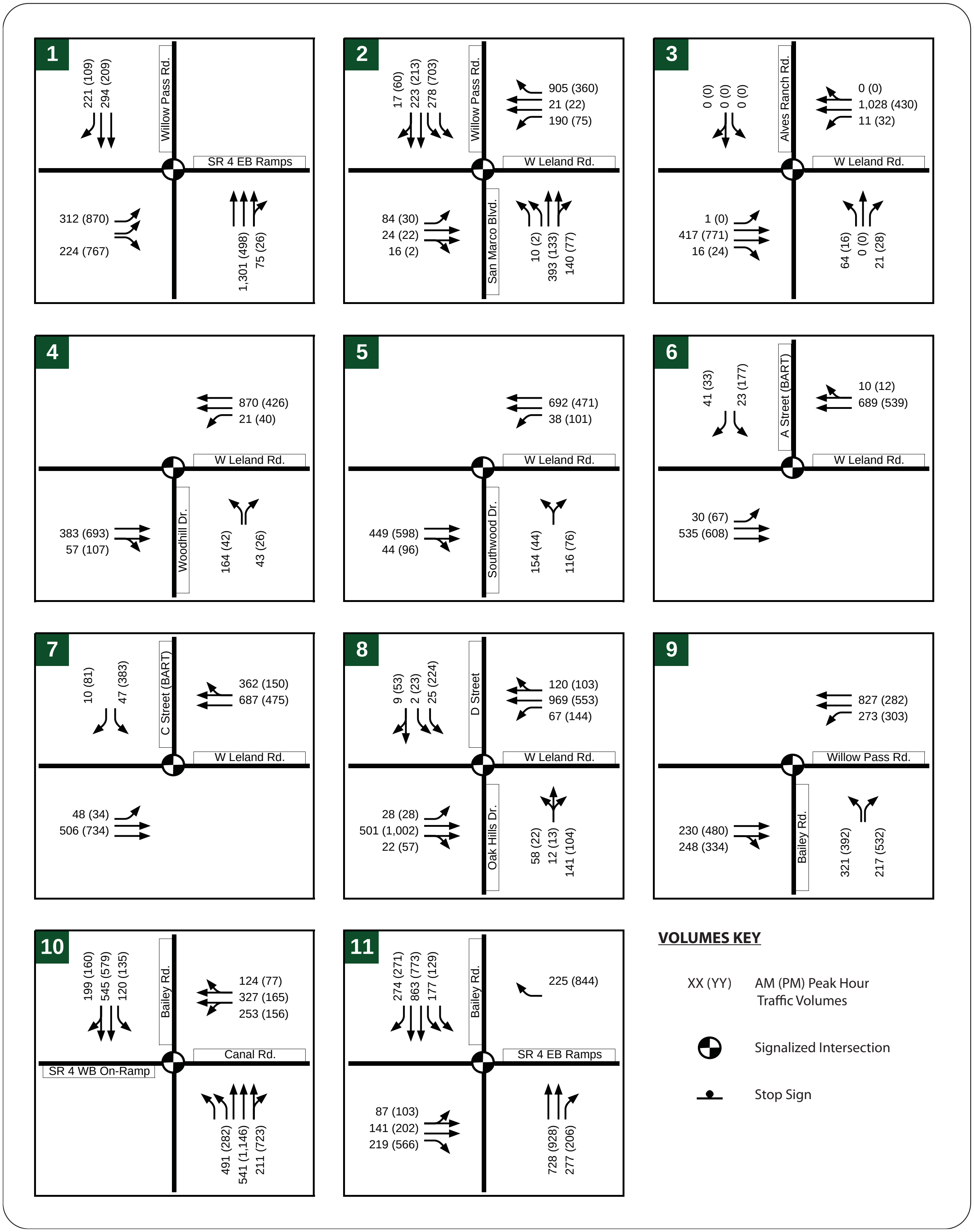

Source: Fehr and Peers

Figure 4.4-9A

Existing Plus Project Conditions

Peak Hour Traffic Volumes, Land Configurations And Traffic Control

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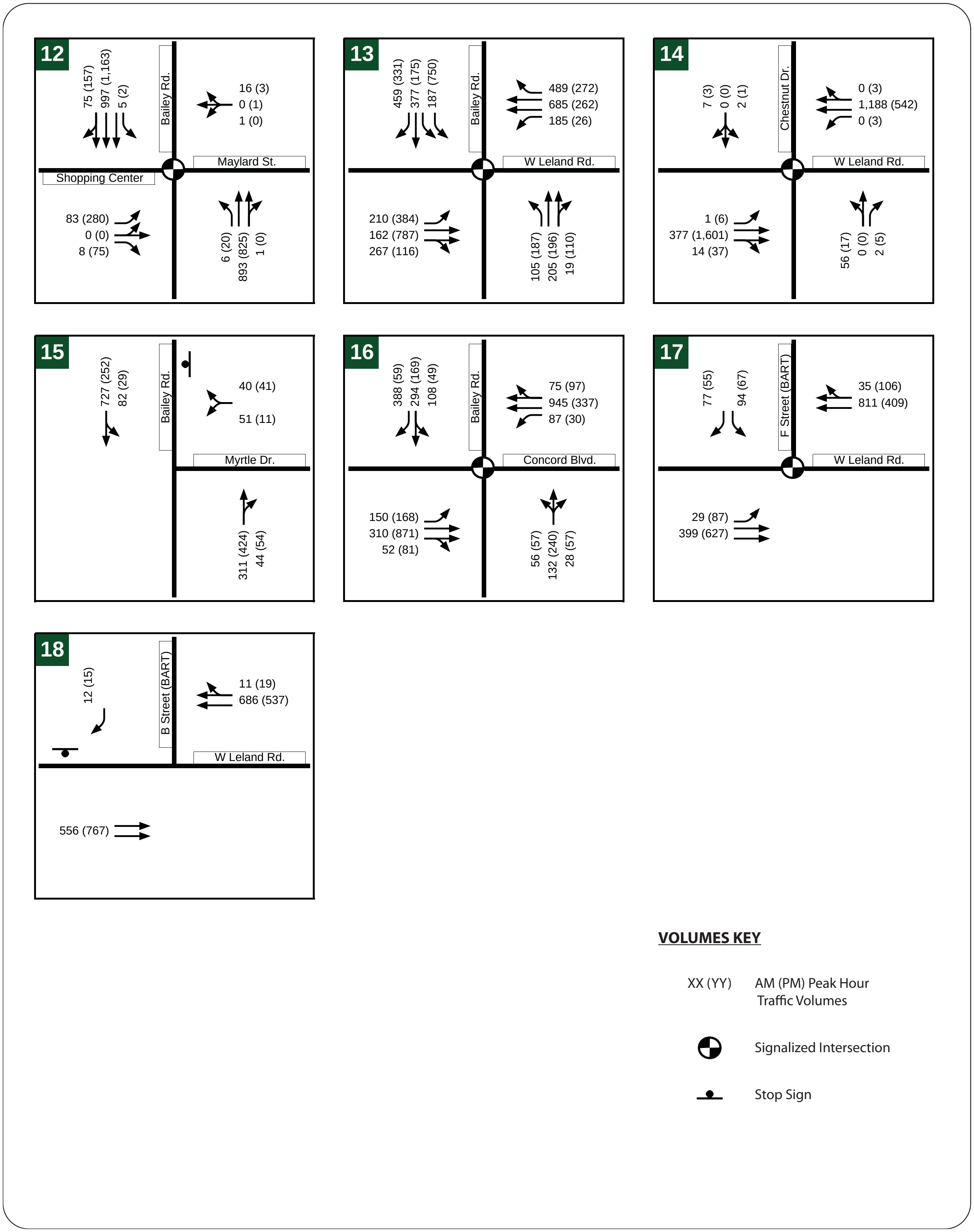

Source: Fehr and Peers

Figure 4.4-9B

Existing Plus Project Conditions

Peak Hour Traffic Volumes, Land Configurations And Traffic Control

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TABLE 4.4-13
EXISTING NO PROJECT, EXISTING PLUS PROJECT AND WITH MITIGATION SCENARIO SUMMARY – CCTALOS METHOD

#	Intersection	Peak Hour	Existing No Project		Existing Plus Project			With Mitigation			Proposed Mitigation Measures	Timing	Responsibility	Significance After Mitigation[2]
			V/C Ratio or Delay[1]	LOS	V/C Ratio or Delay [1]	LOS	Change From Existing	V/C Ratio or Delay [1]	Mitigated LOS	Change from Existing No Project				
1	San Marco Boulevard /SR 4 Eastbound Ramps	AM PM	0.39 0.45	A A	0.45 0.56	A A	0.06 0.11				No mitigation required.	n/a	n/a	n/a
2	San Marco Boulevard /West Leland Road	AM PM	0.38 0.32	A A	0.54 0.39	A A	0.16 0.06				No mitigation required.	n/a	n/a	n/a
3	West Leland Road/Alves Ranch Road	AM PM	0.39 0.22	A A	0.43 0.27	A A	0.04 0.05				No mitigation required.	n/a	n/a	n/a
4	West Leland Road/Woodhill Drive	AM PM	0.39 0.25	A A	0.44 0.31	A A	0.05 0.06				No mitigation required.	n/a	n/a	n/a
5	West Leland Road/Southwood Drive	AM PM	0.42 0.30	A A	0.44 0.36	A A	0.02 0.06				No mitigation required.	n/a	n/a	n/a
6	West Leland Road/West BART Driveway/A Street	AM PM	0.25 0.44	A A	0.29 0.32	A A	0.04 -0.10				No mitigation required.	n/a	n/a	n/a
7	West Leland Road/East BART Driveway/C Street	AM PM	0.30 0.27	A A	0.42 0.46	A A	0.12 0.19				No mitigation required.	n/a	n/a	n/a
8	West Leland Road/Oak Hills Drive/D Street 2	AM PM	3 (20) 3 (21)	A (C) A (C)	0.61 0.61	B B	N/A				No mitigation required.	n/a	n/a	n/a
9	Bailey Road/Willow Pass Road	AM PM	0.46 0.58	A A	0.52 0.67	A B	0.05 0.09				No mitigation required.	n/a	n/a	n/a
10	Bailey Road/SR 4 Eastbound On-ramp/Canal Road	AM PM	0.56 0.64	A B	0.59 0.64	A B	0.03 0.00				No mitigation required.	n/a	n/a	n/a
11	Bailey Road/SR 4 Eastbound Ramps	AM PM	0.39 0.63	A B	0.43 0.70	A B	0.05 0.07				No mitigation required.	n/a	n/a	n/a
12	Bailey Road/Maylard Street/Shopping Center	AM PM	0.32 0.37	A A	0.34 0.41	A A	0.02 0.04				No mitigation required.	n/a	n/a	n/a
13	Bailey Road/West Leland Road	AM PM	0.68 0.65	B B	0.75 0.72	C C	0.07 0.07				No mitigation required.	n/a	n/a	n/a
14	West Leland Road/Chestnut Drive	AM PM	0.43 0.51	A A	0.44 0.53	A A	0.01 0.02				No mitigation required.	n/a	n/a	n/a
15	Bailey Road/Myrtle Drive (Concord)	AM PM	4 (37) 1 (12)	A (E) A (B)	5 (47) 1 (14)	A (E) A (B)	1 (10) >1 (2)				No mitigation required.	n/a	n/a	n/a
16	Bailey Road/Concord Boulevard	AM PM	0.79 0.65	C B	0.84 0.72	D C	0.05 0.07				No mitigation required.	n/a	n/a	n/a
17	West Leland Road/F Street	AM PM	N/A	N/A	0.32 0.24	A A	N/A				No mitigation required.	n/a	n/a	n/a
18	B Street/West Leland Road	AM PM	N/A	N/A	0 (11) 0 (9)	A (B) A (A)	N/A				No mitigation required.	n/a	n/a	n/a

Notes: *1. For signalized intersections, CCTA volume to capacity (v/c) ratios and corresponding level of service based on Technical Procedures (CCTA 2006). For side-street stop-controlled intersections, delay is reported as intersection average (worst minor street approach) and corresponding LOS for unsignalized intersections based on Highway Capacity Manual (Transportation Research Board 2000).*
2. Intersection is unsignalized under Existing No Project conditions and signalized under Existing Plus Project conditions.

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Freeway Operations

The Delay Index on freeway segments was evaluated under the Existing Plus Project condition and compared to Existing conditions, as shown in **Table 4.4-14**.

The addition of project traffic is not expected to degrade the Delay Index on SR 4 in the study area. Therefore, the impact to the freeway system is considered **less than significant**.

TABLE 4.4-14
EXISTING PLUS PROJECT CONDITIONS – FREEWAY MAINLINE SPEEDS AND DELAY INDEX

Segment	Direction[1]	Existing No Project		Existing Plus Project	
		AM	PM	AM	PM
SR 4 (Between SR 242 and Bailey Road)	WB	1.1	1.8	1.1	1.8
	EB	1.2	1.1	1.2	1.1
SR 4 (Between Bailey Road and Loveridge Road)	WB	1.7	1.4	1.7	1.4
	EB	1.1	1.2	1.2	1.2

Source: CCTA, Final 2007 Traffic Service Objective Monitoring Report and Fehr & Peers, 2011
Notes: 1. WB = westbound; EB = eastbound

Mitigation Measures

None required.

Construction-Related Traffic Impacts

Impact 4.4.2 Development of the proposed Master Plan could substantially increase hazards during the construction period due to the increased truck traffic, restricted circulation within the existing BART parking lot during the construction, and potential parking shortages if existing parking areas are used for construction staging and alternative parking supplies are not provided. This impact is considered **potentially significant**.

The proposed project would be constructed in six phases, with each construction phase anticipated to last several years at different rates of development at any given time. Impacts to transportation and traffic during the construction phase of the proposed project include the potential to disrupt traffic flows, block lanes in area roadways, and contribute to decreased levels of service and/or increased volumes of traffic in fewer lanes. Traffic impacts during project construction can also include disruption of alternative modes of transportation, such as blocking bicycle or pedestrian pathways or public transit lanes on area roadways. Additional impacts may result during the construction phase of the proposed project, when there are heavy-duty construction vehicles sharing the roadway with normal vehicle traffic. This can create impacts due to incompatible uses and hazards. Impacts resulting to transportation system due to project construction will be temporary in nature; however, this impact is considered **significant**.

Mitigation Measures

MM 4.4.2 Future developers shall develop a construction management plan for review and approval by the City of Pittsburg Engineering Division. The plan shall include at least the following items:

- Development of a construction truck route that would appear on all construction plans to limit truck and auto traffic on nearby residential streets.

- Comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak hour traffic hours and peak activity of the BART station, detour signs if required, lane closure procedures, sidewalk closure procedures, cones for drivers, and designated construction access routes.

- Identification of alternative parking supplies for existing BART patrons and construction workers when existing parking facilities are unavailable.

- Notification procedures for adjacent property owners and public safety personnel regarding when major deliveries, detours, and lane closures would occur.

- Location of construction staging areas for materials, equipment, and vehicles.

- Identification of haul routes for movement of construction vehicles that would minimize impacts on vehicular and pedestrian traffic, circulation and safety, and provision for monitoring surface streets used for haul routes so that any damage and debris attributable to the haul trucks can be identified and corrected by the developer.

- A process for responding to, and tracking, complaints pertaining to construction activity, including identification of an on-site complaint manager.

Timing/Implementation: *Mitigation to occur prior to and during construction. Plan shall be submitted prior to issuance of grading permit.*

Enforcement/Monitoring: *City of Pittsburg Engineering Division.*

Implementation of mitigation measure **MM 4.4.2** would reduce the proposed project's temporary construction impacts by informing the public of construction schedules, possible detours, and timing to allow the public to select alternate routes in advance of construction periods. By ensuring adequate advance notice of closures and construction, and providing alternate automobile/pedestrian/bicycle routes as necessary to support possible closures and construction, this temporary construction impact is reduced to a **less than significant** level.

Site Circulation and Access

Impact 4.4.3 Development of the proposed Master Plan would include an internal roadway network ensuring adequate emergency access, and all internal roadways would operate at acceptable levels. This impact is considered **less than significant**.

The conceptual Master Plan site plan, shown in **Figure 4.4-10**, would include three upgraded street connections with West Leland Road. Specifically, the project proposes modifications to two existing driveways on West Leland Road, to convert the inbound- and outbound-only driveways to full-access intersections. As shown in **Table 4.4-13**, the existing and proposed project intersections with West Leland Road and Bailey Road are projected to operate at acceptable LOS if they provide the lane configurations shown on **Figure 4.4-9**.

Within the Master Plan Area, new collector and local streets are proposed on a grid system. Within the West Coast Home Builders (WCHB) site, site planning is conceptual, but there will not be a vehicular connection between the WCHB site and the BART-owned portion of the project site. Collectors in the Master Plan area are A, C, and Main streets, and D Street south of Main Street. Collector streets in the Master Plan area would provide the following:

- One 10-foot-wide automobile travel lane in each direction (with additional turn lanes at the signalized intersections on West Leland Road).
- Bicycle facilities on both sides of the street. 6-foot bicycle lanes would be provided along A and Main streets and on D Street south of Main Street. C Street would provide 3-foot sharrows.[4]
- 8-foot parking lanes on both sides of the street.
- Sidewalks on both sides of the street with planter strips separating them the parking lane. Sidewalks would be 8.5 to 10 feet wide along collectors with residential frontage and 10.5 to 12 feet wide along nonresidential uses.

D Street would be aligned with Oak Hills Drive across West Leland Road; however, A Street would continue to be offset from Southwood Drive.

Local streets typically have low traffic volumes and provide direct access to adjacent residential uses. Local streets in the Master Plan area are B and E streets. Within the Master Plan area, local streets would provide:

- One 10-foot automobile travel lane in each direction.
- 8-foot parking lanes on both sides of the street.
- Sidewalks on both sides of the street with planter strips separating them the parking lane. Sidewalks would be 8.5 feet wide.

The projected traffic volumes on the internal streets are expected to be well below the vehicle-per-day threshold of 15,000 vehicles per day (VPD) for collector roadways and 5,000 VPD for local streets.[5] Internal Master Plan intersections are projected to operate acceptably with side-street stop control, all-way stop control, or roundabout control. Therefore, this impact would be **less than significant**.

Mitigation Measures

None required.

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[4] A sharrow is a pavement marking indicating that the travel lane is shared by motorists and bicyclists.

[5] Thresholds established in City of Pittsburg General Plan (2001), page 7-5.

Adopted Alternative Transportation Policies, Plans, or Programs

Impact 4.4.4 Development of the proposed Master Plan would conflict with some adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, transit load factors, bicycle racks, pedestrian amenities), namely those related to bicycle circulation. This impact is considered **potentially significant**.

Transit

As the Master Plan is not located in the vicinity of the planned eBART extension and as by their nature transit-oriented developments (TOD) do not generally affect the feasibility or effectiveness of TOD development elsewhere, development at the Pittsburg/Bay Point BART Station would not preclude construction of the eBART extension and TOD development elsewhere in the region. The transit trips generated by the proposed project were estimated through the Institute of Transportation Engineers' (ITE) Trip Generation, BART Direct Ridership Model (DRM), and the mixed-use development (MXD) model. Currently, about 15 percent of residents living in the project vicinity use public transportation to commute to work, with 11 percent using BART and the remaining 4 percent using bus transit service. The proposed Master Plan is estimated to generate approximately 1,600 new daily BART trips, including 165 AM peak hour and 172 PM peak hour trips. Bus transit trips are expected to increase by approximately 330 daily trips, including 8 AM and 31 PM peak hour trips.

Tri Delta Transit and Rio Vista Delta Breeze

An impact would occur on bus transit if the project caused 90 percent of buses to arrive five minutes after the scheduled arrival or if project-related traffic congestion would substantially increase travel times. Development of the project is expected to increase delay at the intersections that provide access to the Master Plan area, potentially increasing travel time for transit buses. The project would include bus-only facilities and would provide an intermodal station area. Thus, buses would be provided with their own facilities to minimize potential conflicts with other travel modes. In addition, based on the results of the intersection LOS analysis presented earlier, all study intersections would continue to operate at an acceptable LOS during both AM and PM peak hours under Existing Plus Project conditions after mitigation, indicating minimal delays to bus operations. Thus, the impact to transit buses is expected to be **less than significant**.

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Figure 4.4-10

Project Land Use And Circulation Plan

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The project would result in a significant impact if the average number of bus passengers per hour is reduced to below 15 persons. Since the Master Plan area is currently served by several bus routes and the Master Plan is expected to increase the number of transit riders, the addition of transit riders is a **less than significant** impact.

BART Standing Capacity

An impact would occur on a BART line if the project would add more than 3 percent, roughly three passengers per car, of the total ridership on a line when the average load exceeds the standing room capacity. The existing maximum load factor for the Pittsburg/Bay Point–San Francisco Airport line at the station is 0.38 for westbound travel and 0.34 for eastbound travel.

Approximately 165 AM peak hour and 172 PM peak hour riders are expected to be added to BART as a result of the proposed Master Plan. This EIR assumes that the BART parking lot at the station would continue to provide the same number of parking spaces. If the BART parking supply is reduced, then fewer riders would use the Pittsburg/Bay Point BART Station.

After distributing the project BART riders between the number of trains per hour and the number of cars in each train during the peak hour, the project would add approximately four to five passengers per car during both the AM and PM peak hours. While this is greater than three passengers per car, all trains currently have excess standing room capacity at the Pittsburg/Bay Point BART Station.

Since the Pittsburg/Bay Point BART Station is an end of the line station, BART trains near the station have one of the lowest load factors on the Pittsburg/Bay Point-SFO line. Load factors typically increase as trains move west. In general, BART trains operate at or above the standing room capacity in Oakland and Downtown San Francisco during both AM and PM peak commute periods. However, the number of BART riders generated by the proposed Master Plan would decrease further away from the Pittsburg/Bay Point BART Station as project riders would alight the train for their destination. Thus the project's contribution to load factors would decrease to less than 3 percent where load factors exceed standing room capacity.

Since the existing load factors during the peak hour do not exceed the standing room capacity near the Pittsburg/Bay Point BART Station, and the project would add less than 3 percent of the total ridership where ridership exceeds standing room capacity, the projected increase is considered **less than significant**.

BART Fare Gate Capacity

An impact would occur at a BART station if the project would add an average wait time of one minute or more at the fare gates. The current peak-hour ridership at the Pittsburg/Bay Point BART Station is about 1,313 trips (1,253 entries and 60 exits) during the morning peak hour (7:30–8:30 AM) and 1,218 trips (103 entries and 1,115 exits) during the evening peak hour (5:00–6:00 PM). On average, gates process one patron every two to three seconds, with current peak wait times significantly less than one minute.

Buildout of the proposed project would generate 165 BART trips during the AM peak hour (160 entries and 5 exits) and 172 BART trips during the PM peak hour (37 entries and 135 exits). The exiting trips during the PM peak hour are expected to have the greatest effect on fare gate queuing. The expected increase in BART ridership would increase the peak hour exiting trips by about 12 percent. Since average PM peak hour wait time at the fair gates is approximately 25 seconds, average wait times are anticipated to remain less than one minute. Therefore, the project impacts with respect to BART gate capacity would not be substantial. Based on the station layout and the estimated fare gate queues, there would be sufficient queuing space within the station to avoid passengers backing up onto escalators or stairs. The proposed project is expected to have a **less than significant** impact on BART fare gate capacity.

Pedestrian Impacts

In addition to impacts resulting from conflicts with adopted policies, plans, or programs supporting alternative transportation, a significant pedestrian impact would result if the proposed project causes substantial overcrowding on public sidewalks, creation of hazardous conditions for pedestrians, or elimination of pedestrian access to adjoining areas.

Currently, about 5 percent of BART riders at the Pittsburg/Bay Point BART Station walk to access the station. Additional pedestrian counts conducted in January 2011 confirm the relatively low walking mode share to the station. As the area around the project develops and improvements to the existing pedestrian system are constructed, an increase in pedestrian travel is expected both within and to/from the Master Plan area. However, the proposed project is not expected to generate pedestrian traffic to the level that substantial overcrowding or hazardous conditions on public sidewalks would occur, nor would the project limit pedestrian access to adjoining areas or impede implementation of planned pedestrian facilities.

Existing pedestrian facilities include crosswalks at all intersections accessing the BART station and sidewalks adjacent and leading up to the Master Plan area. New roadways within the Master Plan area would provide sidewalks with at least 6 feet of clear area, sufficient width to provide for comfortable two-way pedestrian travel. On streets where higher pedestrian volumes are expected, such as on streets with ground-floor retail or adjacent to the BART drop-off area, sidewalks at least 10 to 12 feet wide are proposed to accommodate the increased demand. Sidewalks would be constructed on West Leland Road along the WCHB site in conjunction with other roadway improvements.

The proposed Master Plan includes connections to adjacent land uses, including the Oak Hills Shopping Center and WCHB site. Two pedestrian connections are proposed between the station area and the Oak Hills Shopping Center, along Main Street and just north of Garage 1. These pedestrian connections are included in the Master Plan to be consistent with General Plan Policy 7-P-39, which requires direct pedestrian routes between residential and commercial developments. An additional pedestrian connection is proposed between the station area and the WCHB site, and it would be located on the north side of the Master Plan area adjacent to SR 4. Additionally a signalized intersection, with pedestrian amenities, would be constructed on West Leland Road between Woodhill and Southwood drives facilitating pedestrian access to the WCHB site without requiring an unprotected crossing.

No additional off-site intersection modification is proposed as part of the project or as a result of off-site mitigation. However, the proposed project would create three intersections on West Leland Road, including one unsignalized and two signalized intersections, which, if not properly designed, would increase vehicle/pedestrian conflicts on West Leland Road. New internal intersections, including parking garage entry/exit, would also be constructed, which could also result in internal pedestrian/vehicle conflicts if improperly designed.

The Master Plan and Access/Accessibility Plan recommend non-motorized connections to adjacent uses east and west of the Master Plan area, as discussed above. The Master Plan also includes specific design requirements and other standards that would ensure adequate visibility of pedestrians, crosswalks, and other alternative transportation resources. Additionally, the number of curb cuts on internal streets will be limited, pedestrian interfaces with the parking garage main entrances and exits will be controlled, and pedestrian safety will be a required aspect of design. These features will ensure that the impact of the Master Plan on pedestrian circulation and safety will be **less than significant**.

Bicycle Impacts

The construction of new intersections on West Leland Road (see discussion related to pedestrian impacts, above, for more details) would potentially increase vehicle/bicycle conflicts in the area. Additionally, increased bicycle ridership in the area both directly from the addition of residents to the area and indirectly through creation of non-residential uses which would attract additional riders to the Master Plan Area could result in bicycle parking shortages for BART users and other Master Plan area residents/visitors/employees. This impact would be **significant**.

Mitigation Measures

MM 4.4.4 The City of Pittsburg shall complete the planned bicycle network along Bailey Road from West Leland to Willow Pass Road, along West Leland to San Marco Boulevard and along San Marco Boulevard from Rio Verde Circle to West Leland Road prior to issuance of certificates of occupancy.

Timing/Implementation: *Payment of future development projects' fair share shall be made prior to issuance of any building permits.*

Enforcement/Monitoring: *City of Pittsburg Engineering Division*

Completion of the City's bicycle network is currently underway as a part of the Capital Improvement Program (CIP). Developers within the Master Plan Area would be required to pay into the City's Local Transportation Mitigation Fee, which funds these bicycle improvements as well as other improvements described by the CIP. Implementation of the above mitigation measure and the policies and programs outlined in the Master Plan, including wayfinding and bicycle parking requirements, would reduce bicycle impacts to a **less than significant** level.

4.4.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The cumulative condition scenario assumes growth of traffic volumes as a result of increases in population over the next 25 years in the Study Area. The CCTA's Travel Demand Model served as the basis for developing traffic forecasts for the year 2035. The most recent version of the CCTA model, which reflects assumptions in land use growth consistent with the Association of Bay Area Governments Projections 2007, was used to determine cumulative growth in the Study Area. The cumulative scenario also assumes that programmed or planned improvements will be completed, including the extension of eBART service to east Contra Costa County and the widening of SR 4 east of the study area.

The model produced volumes and existing turning movement count data, which were used to estimate future intersection turn movements using the Furness method.[6] **Figure 4.4-11** presents the Cumulative No Project traffic volumes, in which it is assumed that the proposed Master Plan is not constructed.

Project-generated traffic, as shown on **Figure 4.4-8**, was added to the Cumulative No Project volumes to estimate the Cumulative Plus Project traffic volumes. **Figure 4.4-12** presents the Cumulative Plus Project traffic volumes.

Planned improvements to each of the transportation systems in the study area are discussed below.

Transit System

eBART Extension

BART's planned extension into east Contra Costa County, eBART, is currently under construction. The proposed eBART project would provide another commute alternative to the heavily congested SR 4 corridor. The eBART tracks will be located in the SR 4 freeway median. The system will not utilize traditional BART rail technology. The proposed technology is a self-propelled passenger vehicle that uses one or more diesel engines for propulsion power and operates on standard railroad tracks. BART will provide a transfer platform between conventional BART trains and eBART trains approximately one-half mile east of the existing Pittsburg/Bay Point BART Station, and would terminate in Antioch, approximately 10 miles east of the current terminus.

Non-Motorized Transportation System

The Contra Costa Countywide Bicycle and Pedestrian Plan (CCTA 2009b), the East County Bikeway Plan (published by East Contra Costa County's TRANSPLAN committee), and the City of Pittsburg General Plan identify key future bicycle facilities in the project area. Planned bicycle facilities surrounding the project area include improvements to the Delta de Anza (multi-use) Trail; a new bike path along the Contra Costa Canal, immediately north of SR 4; and on-street bike lanes on Bailey Road and West Leland Road.[7]

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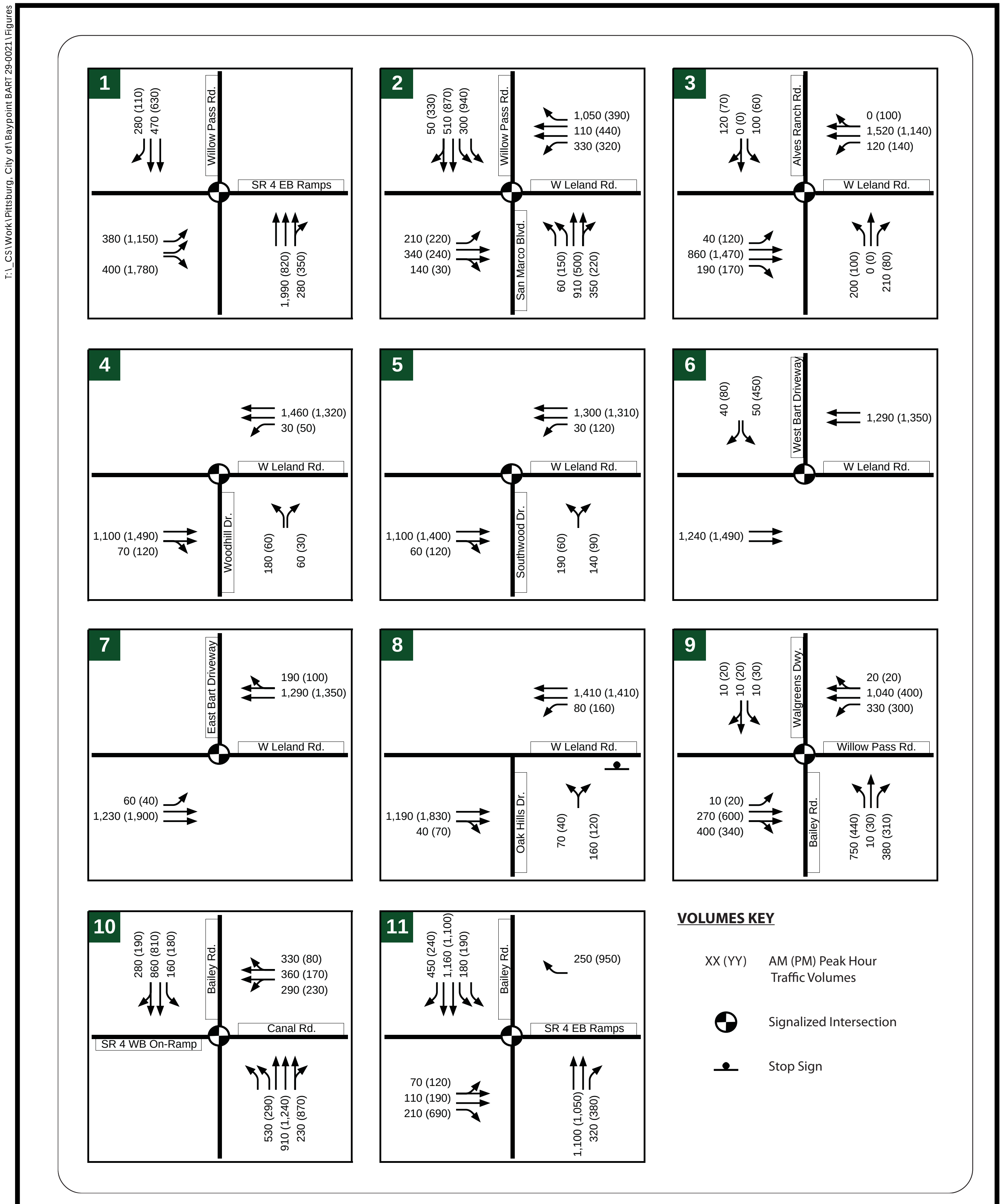
[6] Furnessing is an iterative process that develops future turning movements by applying the difference between the base model volumes and the existing counts to future model approach and departure volumes.

[7] Although the General Plan Bicycle Facilities Map shows a planned Class III bicycle route on Bailey Road between SR 4 and the city limit, current plans include designated Class II bicycle lanes between SR 4 and West Leland Road (Contra Costa County 2010).



Source: Fehr and Peers

Figure 4.4-11A

Cumulative Conditions

Peak Hour Traffic Volumes, Land Configurations And Traffic Control

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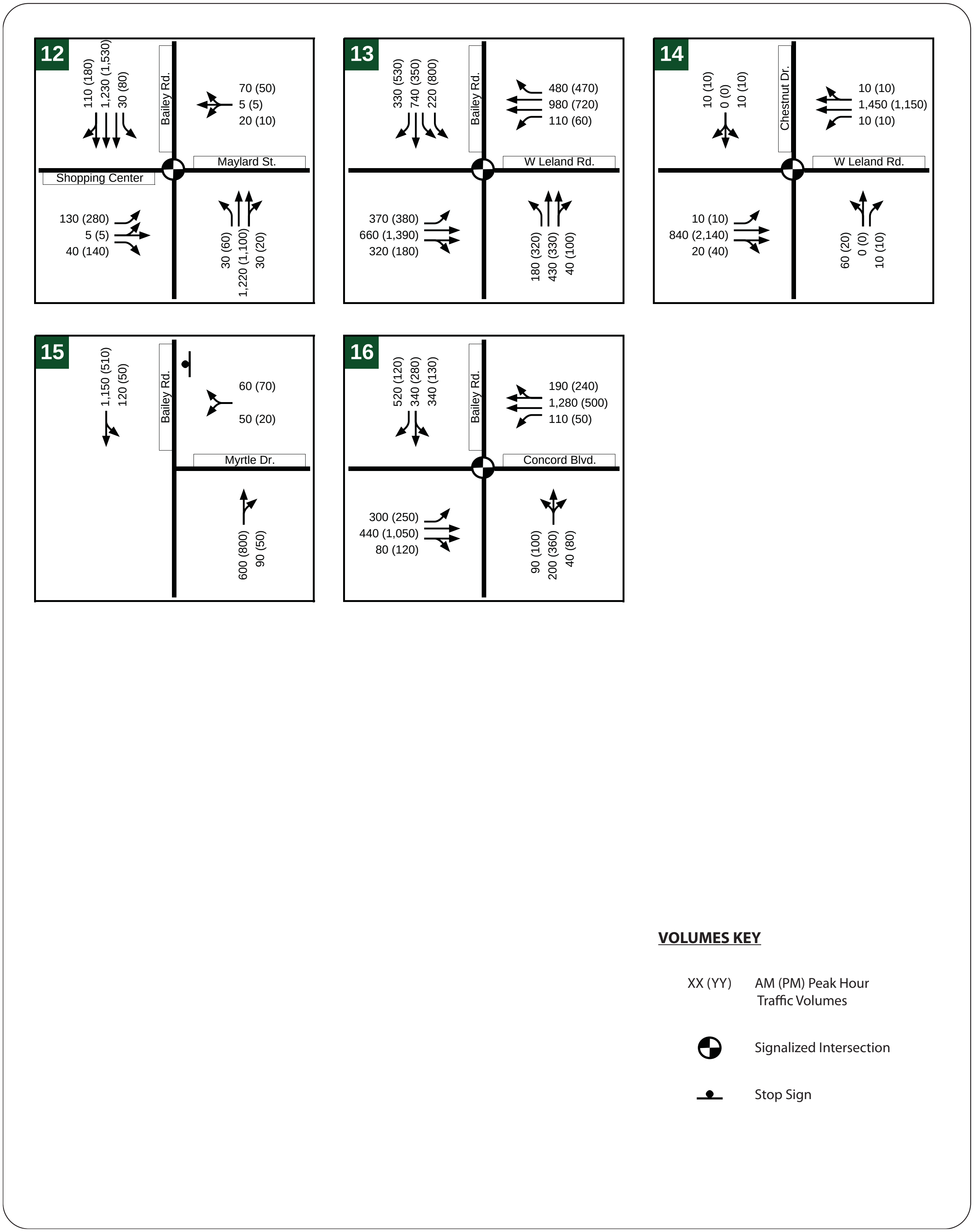
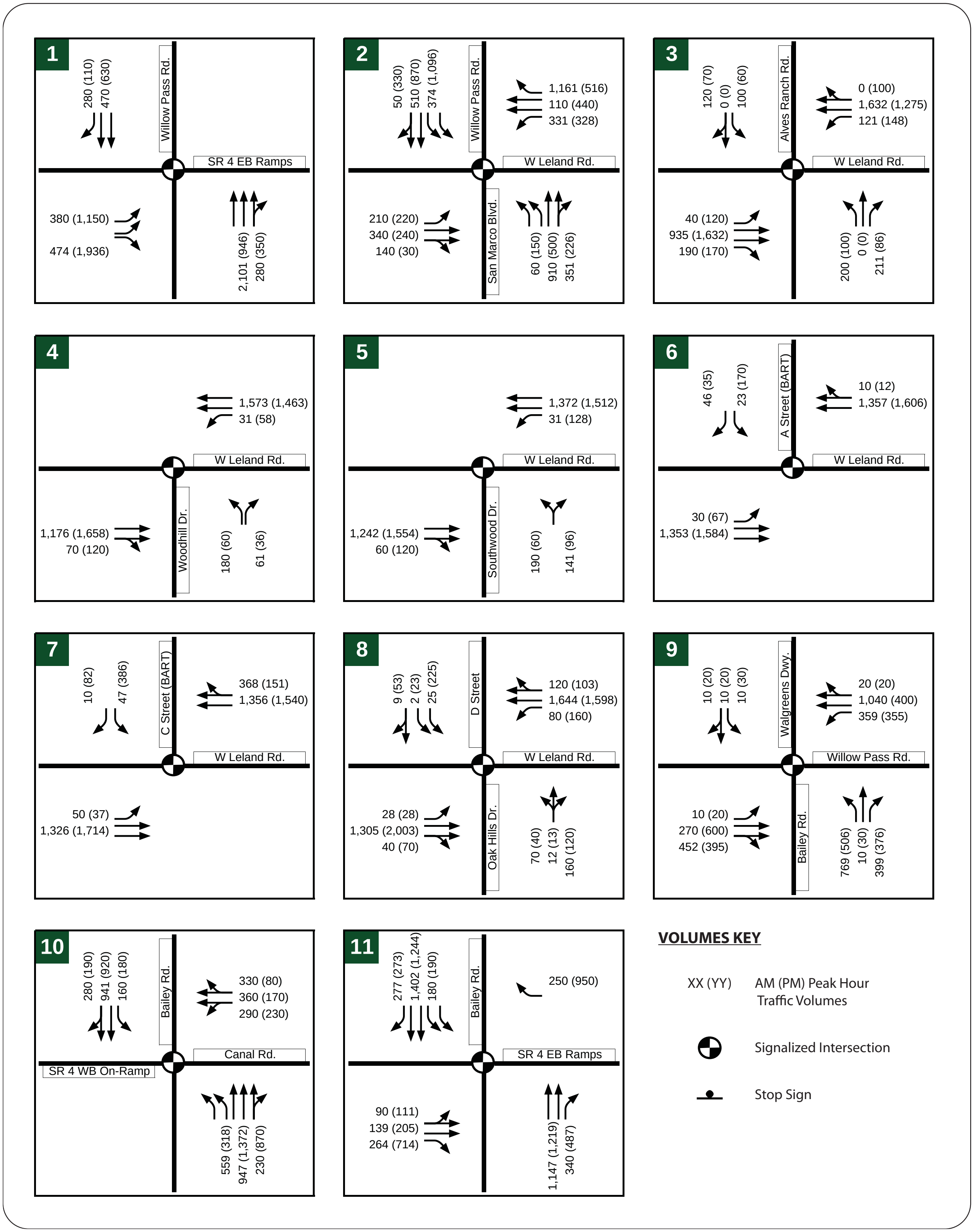


Source: Fehr and Peers

Figure 4.4-11B

Cumulative Conditions

Peak Hour Traffic Volumes, Land Configurations And Traffic Control



Source: Fehr and Peers

Figure 4.4-12A

Cumulative Plus Project Conditions

Peak Hour Traffic Volumes, Land Configurations And Traffic Control

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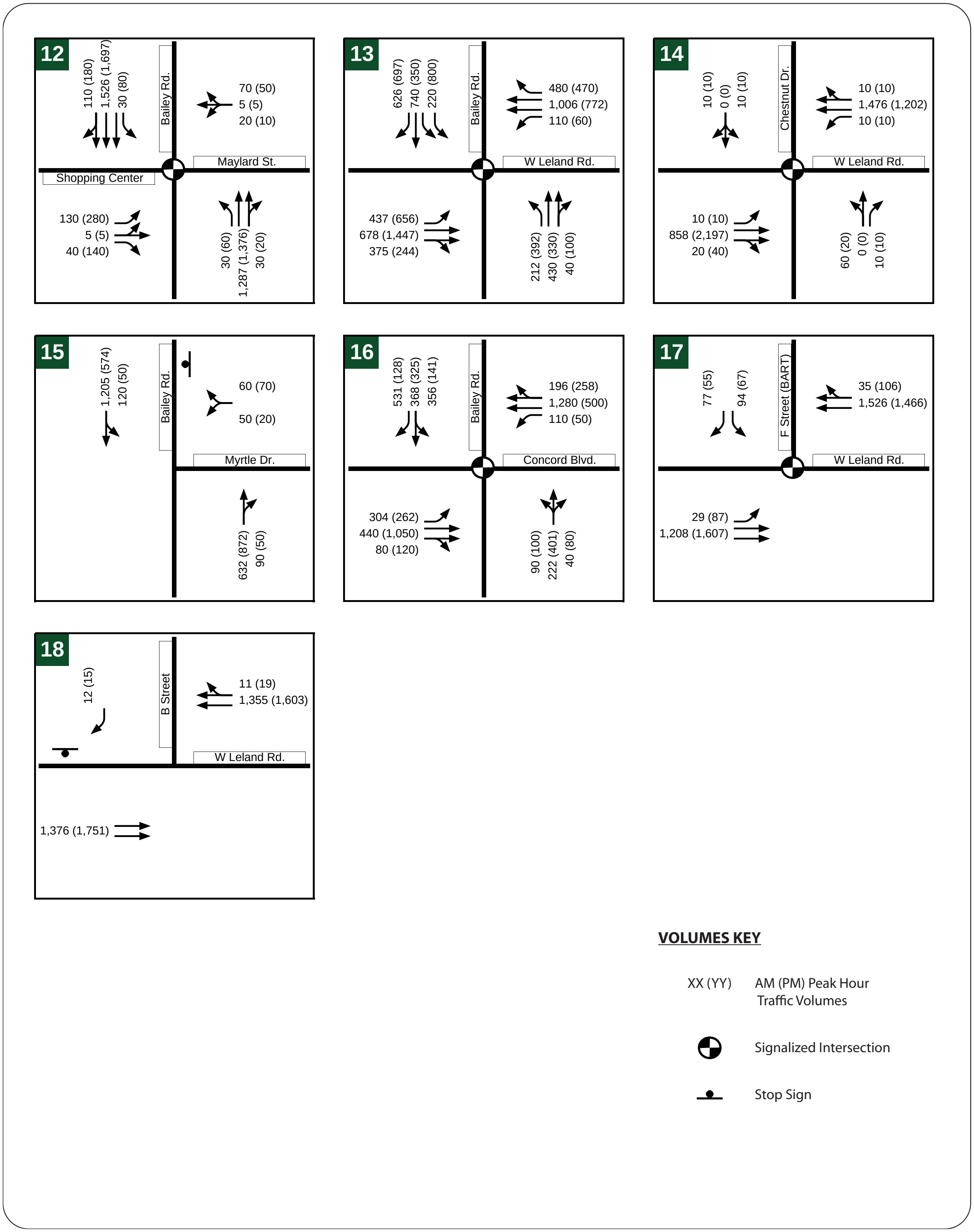

Source: Fehr and Peers

Figure 4.4-12B

Cumulative Plus Project Conditions

Peak Hour Traffic Volumes, Land Configurations And Traffic Control

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Bailey Road Widening Improvement Project

The City of Pittsburg and Contra Costa County are currently planning pedestrian and bicycle improvements along Bailey Road south of SR 4 and West Leland Road. The Bailey Road Improvement Project is a joint City/County project and is approved, funded, and expected to be constructed in summer/fall 2011. This project would consist of the following:

- Continuous 5-foot-wide Class II bike lanes on both sides of the street.
- Continuous 10-foot-wide sidewalk on the west side of the street and 5-foot or wider sidewalk on the east side of the street. The project would also relocate or underground utilities and provide landscaping to improve the walking environment.
- Bus shelters.
- Modifying the three signalized intersections in the project area along Bailey Road at SR 4 Eastbound Ramps/BART access road, Maylard Street/Oak Hills Shopping Center driveway, and West Leland Road, to upgrade the pedestrian crossings to comply with Americans with Disabilities Act (ADA) standards and improve overall walkability.
- Improving street lighting.
- Upgrading the Delta de Anza Trail between Bailey Road and Ambrose Park with landscaping and lighting.

Components of this project, including addition of Class II bicycle lanes and sidewalks on West Leland Road between Oak Hills Drive and South Broadway Avenue, have already been completed.

Bailey Road Pedestrian and Bicycle Improvement Plan

In July 2010, Contra Costa County approved the Bailey Road Pedestrian and Bicycle Improvement Plan. The plan would enhance pedestrian and bicycle facilities and provide a safer, walkable, bikeable, transit-oriented, and visually attractive Bailey Road between the BART access road/SR 4 Eastbound Ramps and Willow Pass Road in Bay Point. The plan includes the following specific improvements that would improve pedestrian and bicycle connectivity between the BART station and Bay Point:

- Provide continuous sidewalks with minimum width of 6 feet, planted buffer zone separating pedestrians from adjacent moving traffic, and pedestrian-scale lighting, on both sides of the street.
- Underground utilities to increase the effective sidewalk widths.
- Provide continuous 5-foot-wide Class II bicycle lanes on both sides of the street.
- Enhance the recently signalized Delta de Anza Trail and Bel Air Trail crossing on Bailey Road.
- Eliminate the loop off-ramp from westbound SR 4 to southbound Bailey Road, the pedestrian tunnel under the off-ramp, and the additional third lane on southbound Bailey Road south of the off-ramp. The removal of the loop off-ramp would eliminate

conflicts between high-speed automobiles merging from the loop off-ramp and pedestrians and bicyclists on the west side of Bailey Road. The removal of the off-ramp would also allow for the removal of the pedestrian tunnel and the provision of a continuous sidewalk adjacent to Bailey Road.

- Improve the directional off-ramp from westbound SR 4 that currently serves northbound Bailey Road to accommodate traffic turning to both northbound and southbound Bailey Road. The Bailey Road/SR 4 Westbound Off-Ramp intersection would be signalized to allow for automobile left turns and a protected pedestrian crossing on the east side of Bailey Road.

- Redesign the loop off-ramp from eastbound SR 4 to northbound Bailey Road so that the right-turn movement is fully controlled by the signal. This would allow the removal of the merging lane on northbound Bailey Road just north of the off-ramp, which would reduce conflicts between automobiles and pedestrians and bicycles and provide space for widening the adjacent sidewalk.

- Eliminate the free right turn from southbound Bailey Road to the BART access road. This movement would be controlled by the existing signal at the intersection.

- Enhance crosswalks at the Bailey Road/BART access road intersection. These improvements would include special paving material, 4-foot setback for vehicular stop bars, ADA-compliant ramps with truncated domes, and countdown pedestrian signals with pedestrian push buttons and audible signals.

The planned improvements require Caltrans approval. In addition, these improvements are not currently fully funded. Since these planned improvements are neither approved nor funded, this analysis does not assume their completion for the cumulative conditions analyses.

Roadway System

In the immediate study area, there are planned roadway system improvements that are fully funded in the Capital Improvements Project (CIP) and would increase vehicular capacity at the study intersections include:

- Extension of San Marco Boulevard southeast, connecting to Bailey Road, is assumed to occur in conjunction with planned land use development in the area.

- Widening of SR 4 to provide four lanes in each direction, including an HOV lane, from Railroad Avenue to Hillcrest Avenue, is assumed to be completed in the cumulative condition, as this improvement is currently under construction.

Fee programs to fund these roadway improvements include:

- Local Transportation Mitigation Fee (LTMF), as described in Pittsburg Municipal Code (PMC) chapter 15.90, to fund local projects identified in the CIP

- Pittsburg Regional Transportation Development Impact Mitigation (PRTDIM), as described in PMC chapter 15.103, to fund local and regional-serving projects

- Bailey Road Traffic Mitigation Measure Inter-Agency Funding Agreement (May 8, 2006) established fees for development that would occur outside of Concord, but that would impact study intersections within Concord (specifically, Bailey Road/Myrtle Drive and Bailey Road/Concord Boulevard intersections). Identified mitigation includes paying a fair share contribution of future roadway improvements identified to the subject intersections.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

This section discusses cumulative impacts on traffic operations. Cumulative impacts on transit ridership and operations are not discussed because transit service is not part of the physical environment and can change over time due to external factors. Both BART and Tri Delta Transit change the frequency of their service based on demand and funding. In addition, Tri Delta Transit can easily modify its routes, eliminate existing routes, or introduce new routes. Regardless of the proposed Master Plan, level of transit service under cumulative conditions is not known at this time nor can it be developed given the number of factors involved. Thus, cumulative project impacts on transit cannot be measured. However, the Master Plan would accommodate an increase in bus ridership by increasing the number of bus bays at the site from nine to ten.

This section also does not discuss cumulative project impacts on pedestrians and bicycles because these impacts are generally site-specific and caused by changes to the physical environment. Changes to the physical environment and their potential impacts on pedestrian and bicycle circulation and safety in the Master Plan area were previously discussed. No additional impacts on pedestrians and bicycles are expected.

The cumulative analysis uses the standards of significance shown in Section 4.4.3 and determines the project impacts by comparing the Cumulative Plus Project to the Cumulative No Project conditions. **Table 4.4-15** summarize the traffic operation under the Cumulative No Project, Cumulative Plus Project, and Cumulative plus Project With Mitigation using CCTALOS methods.

Cumulative Increase in Traffic

Impact 4.4.5 The proposed Master Plan may cause an increase in traffic that is substantial in relation to the cumulative traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or reduction in level of service) during the cumulative plus project condition. This impact is **cumulatively considerable**.

Roadway Operations

The following cumulative impacts were identified by the cumulative traffic analysis:

- **San Marco Boulevard/SR 4 Eastbound Ramps**: This intersection is projected to operate deficiently in the Cumulative No Project condition in the PM peak hour. The addition of project traffic would increase the volume-to-capacity ratio.

- **San Marco Boulevard/West Leland Road**: This intersection is projected to operate deficiently in the Cumulative No Project condition in both AM and PM peak hours. The addition of project traffic would increase the volume-to-capacity ratio during both peak hours.

- **West Leland Road/Oak Hills Drive/D Street**: This intersection is projected to operate at an overall acceptable level in the Cumulative No Project condition in both AM and PM peak hours using the HCM analysis method, although side-street operations would experience excessive delay. With development of the proposed project, a fourth approach, D Street, would be added to the intersection to provide access to and from the Master Plan Area, and the resulting intersection would be signalized. The signalized intersection would operate deficiently in the Cumulative Plus Project conditions in the PM peak hour.

- **Bailey Road/Willow Pass Road**: This intersection is projected to operate deficiently in the Cumulative No Project condition in the AM peak hour. The addition of project traffic would increase the volume-to-capacity ratio.

- **Bailey Road/West Leland Road**: This intersection is projected to operate deficiently in the Cumulative No Project condition in both AM and PM peak hours. The addition of project traffic would increase the volume-to-capacity ratio during both peak hours.

- **Bailey Road/Concord Boulevard**: This intersection is projected to operate deficiently in the Cumulative No Project condition in the AM peak hour. The addition of project traffic would increase the volume-to-capacity ratio during the AM peak hour and result in deficient operations during the PM peak hour.

All of the above cumulative impacts are expected to be significant. While they are cumulative in nature, and would thus be created by the proposed Master Plan only in combination with other existing, approved, and anticipated development in the cumulative setting, the proposed Master Plan's contribution to these impacts would be **cumulatively considerable**.

Freeway Operations

The Delay Index was evaluated for the Cumulative Plus Project condition and compared to Cumulative No Project conditions, as shown in **Table 4.4-16** below.

The addition of project traffic is not expected to degrade the Delay Index on SR 4 in the study area. Therefore, the cumulative impact to the freeway system is considered less than cumulatively considerable.

TABLE 4.4-15
CUMULATIVE CONDITIONS – FREEWAY MAINLINE SPEEDS AND DELAY INDEX

Segment	Direction[1]	Cumulative No Project		Cumulative Plus Project	
		AM	PM	AM	PM
SR 4 (Between SR 242 and Bailey Road)	WB	1.4	1.9	1.5	1.9
	EB	1.3	1.3	1.3	1.3
SR 4 (Between Bailey Road and Loveridge Road)	WB	1.2	1.1	1.2	1.1
	EB	1.4	1.1	1.4	1.1

Source: CCTA, Final 2007 Traffic Service Objective Monitoring Report and Fehr & Peers, 2011
Notes: 1. WB = westbound; EB = eastbound

TABLE 4.4-16
CUMULATIVE NO PROJECT, CUMULATIVE PLUS PROJECT AND WITH MITIGATION SCENARIO SUMMARY – CCTALOS METHOD

#	Intersection	Peak Hour	Cumulative No Project		Cumulative Plus Project			With Mitigation			Proposed Mitigation Measures (Summary, see Impact Statement for Full Mitigation Description)	Timing	Responsibility	Significance After Mitigation
			V/C Ratio or Delay[1]	LOS	V/C Ratio or Delay[1]	LOS	Change from Cumulative No Project	V/C or Delay[1]	Mitigated LOS	Change from Cumulative No Project				
1	San Marco Boulevard/SR 4 Eastbound Ramps	AM PM	0.76 **1.26**	C **F**	0.84 **1.38**	D **F**	0.08 0.12	0.73 **0.91**	C **E**	-0.03 -0.35	Restripe second eastbound left-turn lane to a shared left/right turn lane.	Prior to Project Buildout	Caltrans	LTS (SU)[3]
2	San Marco Boulevard /West Leland Road	AM PM	1.00 0.85	E D	**1.10** **0.91**	**F** **E**	0.10 0.06	0.79 0.84	C D	-0.21 -0.01	Provide a third northbound receiving lane to allow free westbound right turns. Modify northbound approach to provide one left-turn lane, two through lanes, and one right-turn lane.	Prior to Project Buildout	City	LTS
3	West Leland Road/Alves Ranch Road	AM PM	0.72 0.69	C B	0.75 0.75	C C	0.03 0.06				No mitigation required.	N/A	N/A	N/A
4	West Leland Road/Woodhill Drive	AM PM	0.66 0.59	B A	0.71 0.64	C B	0.05 0.05				No mitigation required.	N/A	N/A	N/A
5	West Leland Road/Southwood Drive	AM PM	0.71 0.65	C B	0.73 0.71	C C	0.02 0.06				No mitigation required.	N/A	N/A	N/A
6	West Leland Road/West BART Driveway/A Street	AM PM	0.49 0.74	A C	0.52 0.65	A B	0.03 -0.09				No mitigation required.	N/A	N/A	N/A
7	West Leland Road/East BART Driveway/C Street	AM PM	0.52 0.56	A A	0.66 0.79	B C	0.13 0.23				No mitigation required.	N/A	N/A	N/A
8	West Leland Road/Oak Hills Drive/D Street[4]	AM PM	5 (**57**) 7 (**145**)	A (**F**) A (**F**)	0.71 **0.95**	C **E**	N/A	0.66 0.93	B E	N/A	Restripe northbound approach to separate left-turn and shared through/right lane and modify traffic signal to provide protected north-south left-turn phasing.	Prior to Project Buildout	City	SU
9	Bailey Road/Willow Pass Road	AM PM	**0.96** 0.79	**E** C	**1.02** 0.88	**F** D	0.06 0.09	0.80 0.75	D C	-0.16 -0.04	Restripe the northbound approach to convert the through lane to a shared left/through lane. Maintain split phasing.	Prior to Project Buildout	Contra Costa County	LTS(SU)[3]
10	Bailey Road/SR 4 Eastbound On-ramp/Canal Road	AM PM	0.81 0.78	D C	0.84 0.78	D C	0.03 0.0				No mitigation required.	N/A	N/A	N/A
11	Bailey Road/SR 4 Eastbound Ramps	AM PM	0.55 0.83	A D	0.62 0.91	B E	0.07 0.08				No mitigation required.	N/A	N/A	N/A
12	Bailey Road/ Maylard Street/ Shopping Center	AM PM	0.54 0.57	A A	0.57 0.66	A B	0.02 0.09				No mitigation required.	N/A	N/A	N/A
13	Bailey Road/West Leland Road	AM PM	**1.08** 0.91	**F** E	**1.15** **1.08**	**F** **F**	0.07 0.17	**0.97** **0.87**	**E** **D**	-0.11 -.04	Restripe northbound approach to add second left-turn lane. Widen eastbound approach to provide second left-turn lane and a right-turn lane	Prior to Project Buildout	City	LTS
14	West Leland Road/Chestnut Drive	AM PM	0.55 0.72	A C	0.56 0.74	A C	0.01 0.02				No mitigation required.	N/A	N/A	N/A
15	Bailey Road/Myrtle Drive	AM PM	12 (**178**) 2 (28)	B (**F**) A (D)	15 (**234**) 3 (34)	B (**F**) A (D)	3 (56) 1 (6)				No mitigation required.	N/A	N/A	N/A
16	Bailey Road/Concord Boulevard	AM PM	**1.24** 0.96	**F** E	**1.28** **1.02**	**F** **F**	0.04 0.06				No feasible mitigation available.	N/A	City of Concord	SU
17	West Leland Road/F Street	AM PM	Does not exist under No Project conditions		0.53 0.55	A A	N/A				No mitigation required.	N/A	N/A	N/A
18	West Leland Road/B Street	AM PM	Does not exist under No Project		<1(12) <1 (12)	A (B) A (B)	N/A				No mitigation required.	N/A	N/A	N/A

*Notes: Numbers in **bold** exceed the threshold as described in Standards of Significance*
1. For signalized intersections, CCTA volume to capacity (v/c) ratios and corresponding level of service based on Technical Procedures (CCTA 2006).For side-street stop-controlled intersections, delay is reported as intersection average (worst minor street approach) and corresponding LOS for unsignalized intersections based on Highway Capacity Manual (Transportation Research Board 2000).
2. LTS = less than significant; SU = significant and unavoidable
3. The proposed mitigation is feasible within the existing right-of-way. However, the City of Pittsburg does not have jurisdiction at this intersection and cannot ensure its implementation. Therefore, the impact is considered significant and unavoidable.
4. Intersection is unsignalized under Cumulative No Project conditions and signalized under Cumulative Plus Project conditions.

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Mitigation Measures

The proposed Master Plan and the accompanying Access/Accessibility Plan include improvements, policies, and strategies that would reduce the overall project automobile trip generation and reduce the magnitude of the potentially significant project-related traffic impacts. The project trip generation, as described above, accounts for some of these project characteristics, including proximity to transit, mix of uses within the Master Plan area, and pedestrian-oriented design. The following improvements, policies, or strategies, as recommended in the Master Plan and/or the Access/Accessibility Plan, would further reduce the project automobile trip generation:

- Aggressive parking polices, such as limiting parking supply, unbundling residential parking from dwelling units, shared parking, and providing on-street metered spaces, to reduce the project dependence on automobile

- A robust Transportation Demand Management (TDM) plan that includes car sharing, ride matching, discounted transit passes for area residents and employees

- Improved non-motorized connections to adjacent uses and trails

It is not possible to accurately predict the effectiveness of the above-listed strategies or to quantify their effects on reducing project automobile trip generation. However, these measures would reduce the magnitude of the identified project impacts on traffic operations at study intersections. To present a conservative analysis, the DEIR assumes that they would not be sufficient to reduce the significant impacts to a less than significant level. Therefore, the impact would remain **significant**.

In addition, the following mitigation measures present improvements at the identified impact locations to reduce the proposed Master Plan's contribution to cumulative impacts:

MM 4.4.5a The City of Pittsburg shall cooperate with Caltrans to develop a program to fund and implement improvements that could include:

- construction of additional turn lanes so as to improve operations at the San Marco Boulevard/SR 4 Eastbound Ramps intersection;

- the conversion of the center eastbound left-turn lane to a left-right shared lane at the intersection of Willow Pass Road and Eastbound SR 4;

Future development projects in the Master Plan Area shall contribute their fair share to these improvements, which include converting the second eastbound left-turn lane to a shared left/right turn lane.

Timing/Implementation: *Payment of future development projects' fair share shall be made prior to approval of any building permits.*

Enforcement/Monitoring: *Caltrans and City of Pittsburg Development Services Department*

Implementation of mitigation measure **MM 4.4.5a** would provide additional turning movement capacity and mitigate the project impact. However since these intersections are under the jurisdiction of Caltrans, neither the City nor a future applicant for development has control over approval or timing of such improvements. Therefore, the impact is considered **significant and unavoidable** because these are outside the jurisdiction of the City of Pittsburg.

MM 4.4.5b Future development projects in the Master Plan Area shall contribute their fair share to implement improvements that would improve intersection operations at the San Marco Boulevard/West Leland Road intersection, including:

- Westbound: Modify north leg of intersection to provide a third receiving lane to permit free westbound right-turn movement.
- Northbound: Modify to provide one left-turn lane, two through lanes, and a right-turn only lane.

These improvements may require traffic signal modifications.

Timing/Implementation: *Payment of future development projects' fair share shall be made prior to issuance of any building permits.*

Enforcement/Monitoring: *City of Pittsburg Development Services Department*

Implementation of mitigation measure **MM 4.4.5b** would provide additional turning movement capacity and result in acceptable intersection operations. This would ensure that the project's contribution to the cumulative impact on this intersection would be **less than cumulatively considerable**.

Were mitigation measure **MM 4.4.5b** constructed, it would require intersection widening, potentially increasing pedestrian crossing time at the intersection, resulting in a secondary pedestrian impact.

MM 4.4.5c As part of development of the BART parcels, the City of Pittsburg shall ensure that construction of the northbound approach of the West Leland Road/Oak Hills Drive/D Street intersection provides a left-turn and a through-right shared lane and modification of the traffic signal to provide protected north-south left-turn movements.

Timing/Implementation: *Payment of future development projects' fair share shall be made prior to issuance of building permits on BART -owned properties.*

Enforcement/Monitoring: *City of Pittsburg Development Services Department in consultation with BART.*

Implementation of mitigation measure **MM4.4.5c** would provide additional turning movement capacity. However, the intersection would continue to operate deficiently. Therefore, this impact will remain **significant and unavoidable** even with implementation of mitigation.

Were mitigation measure **MM 4.4.5c** implemented, all disturbance would occur within the existing intersection right-of-way and would not increase the pedestrian crossing time. Therefore the secondary impact of implementing this mitigation to other modes of travel would be less than significant.

MM 4.4.5d The City of Pittsburg shall cooperate with Contra Costa County to develop a program to fund and implement improvements that would result in acceptable intersection operations at the Bailey Road/Willow Pass Road intersection. Future development projects in the Master Plan Area shall contribute their fair share to these improvements which include conversion of the center through lane to a shared left-through lane.

Timing/Implementation: *Payment of future development projects' fair share shall be made prior to issuance of building permits or in accordance with any future agreements between the County and the City.*

Enforcement/Monitoring: *Contra Costa County Public Works Department and City of Pittsburg Development Services Department*

Implementation of mitigation measure **MM 4.4.5d** would provide additional turning movement capacity and result in acceptable intersection operations. Since this intersection is under the jurisdiction of Contra Costa County, neither the City nor a future applicant for development has control over approval or timing of such an improvement. Therefore, the impact is considered **significant and unavoidable** because it is outside the jurisdiction of the City of Pittsburg.

Mitigation measures **MM 4.4.5d** could be implemented within the existing intersection right-of-way and would not increase the pedestrian crossing time. Therefore the secondary impact of implementing this mitigation to other modes of travel would be less than significant.

MM 4.4.5e Future development projects in the Master Plan Area shall contribute their fair share to implement the following improvements that would improve operations at Bailey Road/West Leland Road intersection:

- Restripe the northbound approach to provide dual left-turn lanes.
- Widen the eastbound approach to add a second left-turn lanes and one right-turn lane

These improvements are consistent with the City of Pittsburg's Five Year Capital Improvement Program 2011-2012 through 2016-2017). These improvements may require traffic signal modifications.

Timing/Implementation: *Payment of future development projects' fair share shall be made prior to issuance of any building permits.*

Enforcement/Monitoring: *City of Pittsburg Development Services Department*

The provision of additional capacity through the implementation of mitigation measure **MM 4.4.5e** would improve the intersection operation as compared to the Cumulative No Project scenario. This would ensure that the project's contribution to the cumulative impact on this intersection would be **less than cumulatively considerable**.

MM 4.4.5e could not be implemented within the existing intersection right-of-way. Additional right-of-way would be needed to widen the eastbound approach at the intersection. In addition, widening the eastbound approach would increase the pedestrian crossing time, resulting in secondary impacts on pedestrians.

MM 4.4.5f The City of Pittsburg shall cooperate with City of Concord to amend the Bailey Road Traffic Mitigation Measure Inter-Agency Funding Agreement to include the proposed developments included in the Pittsburg/Bay Point BART Master Plan. Future development projects in the Master Plan Area shall contribute their fair share to implement the identified improvements.

Timing/Implementation: *Payment of future development projects' fair share shall be made prior to issuance of building permits or in accordance with any future agreements between the the City of Concord and Pittsburg.*

Enforcement/Monitoring: *City of Pittsburg Development Services Department and City of Concord*

Considering existing developments at all four corners of this intersection, potential improvements would require significant right-of-way acquisition. Potential improvements that would widen one or more intersection approaches would also degrade the pedestrian environment. In addition, since this intersection is under the jurisdiction of City of Concord, neither the City of Pittsburg nor a future applicant for development has control over approval or timing of potential improvements. Therefore, the impact is considered **significant and unavoidable** because it is outside the jurisdiction of the City of Pittsburg.

Due to the range of cumulatively considerable impacts for which mitigation is infeasible, the proposed Master Plan's contribution to cumulative impacts would remain **cumulatively considerable** and **significant and unavoidable**.

REFERENCES

Bay Area Rapid Transit (BART) 2008. Spring 2008 System-wide Ridership Data.

———. 2009. 2008 BART Station Profile Study.

California Department of Transportation (Caltrans). 2009. Traffic Data Branch. http://dot.ca.gov/hq/traffops/saferesr/trafdata/2009all.htm.

Cervero, Robert. 1994. Ridership Impacts of Transit-Focused Development in California. Federal Transit Administration.

City of Concord. 2007. Concord 2030 Urban Area General Plan.

———. 2010. Concord Community Reuse Plan Draft Revised Environmental Impact Report.

City of Pittsburg. 2001. Pittsburg 2020: A Vision for the 21st Century. City of Pittsburg General Plan. Includes Amendments through July 2010.

Contra Costa County and City of Pittsburg. 2001. Pittsburg/Bay Point BART Station Area Specific Plan Environmental Impact Report (Recirculated). Prepared in conjunction with Bay Area Rapid Transit. SCH 98022071.

———. 2002. Pittsburg/Bay point BART Station Area Specific Plan. Prepared in conjunction with Bay Area Rapid Transit.

Contra Costa County TRANSPLAN. 2001, November. East County Bikeway Plan.

Contra Costa County Department of Conservation & Development (Contra Costa County). 2010, May. Bailey Road Pedestrian and Bicycle Improvement Plan.

Contra Costa Transportation Authority (CCTA). 2006. Technical Procedures.

———. 2008. Final 2007 Traffic Service Objective Monitoring Report.

———. 2009a. Contra Costa Congestion Management Program.

———. 2009b. Contra Costa Countywide Bicycle and Pedestrian Plan.

———. 2009c. East Contra Costa Action Plan for Routes of Regional Significance.

Institute of Transportation Engineers (ITE). 2008. Trip Generation, 8th ed.

Lund, Hollie M., Robert Cervero, and Richard Wilson. 2004. Travel Characteristics of Transit-Oriented Development in California. Funded by Caltrans Transportation Grant.

Transportation Research Board. 2000. 2000 Highway Capacity Manual.

Tri-Delta Transit. 2009, May. Email communication from Tom Harris.

4.5 Noise

This section discusses the existing noise setting, identifies potential noise impacts associated with implementation of the proposed Master Plan, and recommends mitigation measures to address potential impacts. Specifically, this section analyzes potential noise impacts due to development of the Master Plan area relative to the existing ambient noise environment and applicable noise criteria. Noise mitigation measures are recommended where the predicted noise levels would exceed applicable noise standards.

4.5.1 EXISTING SETTING

CONCEPTS AND TERMINOLOGY

Acoustic Fundamentals

Noise is generally defined as sound that is loud, disagreeable, or unexpected. Sound is mechanical energy transmitted in the form of a wave because of a disturbance or vibration. Sound levels are described in terms of both amplitude and frequency.

Amplitude

Amplitude is defined as the difference between ambient air pressure and the peak pressure of the sound wave. Amplitude is measured in decibels (dB) on a logarithmic scale. Amplitude is interpreted by the ear as corresponding to different degrees of loudness. Laboratory measurements correlate a 10 dB increase in amplitude with a perceived doubling of loudness and establish a 3 dB change in amplitude as the minimum audible difference perceptible to the average person.

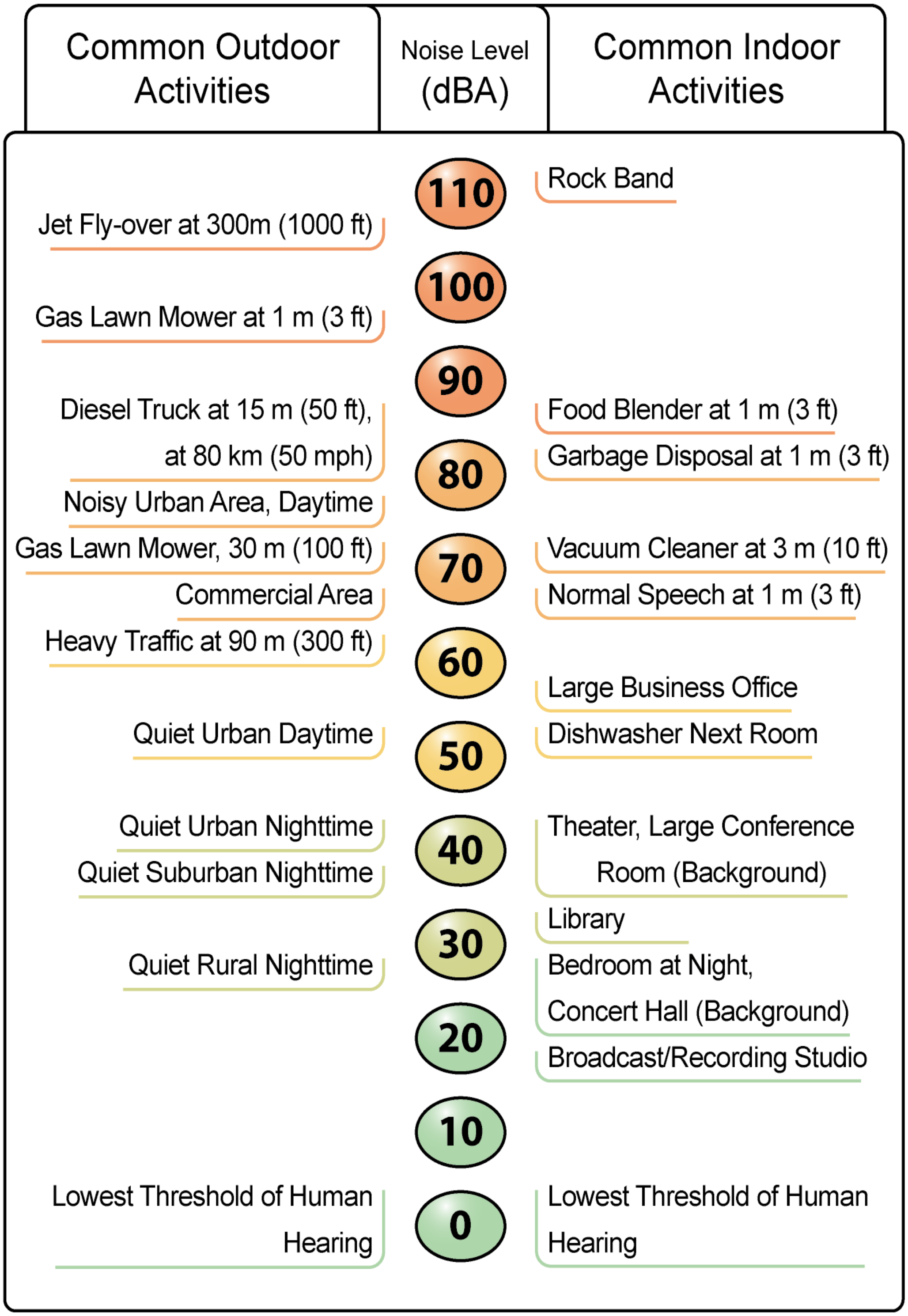
Frequency

The frequency of a sound is defined as the number of fluctuations of the pressure wave per second. The unit of frequency is the Hertz (Hz). One Hz equals one cycle per second. The human ear is not equally sensitive to sound of different frequencies. For instance, the human ear is more sensitive to sound in the higher portion of this range than in the lower and sound waves below 16 Hz or above 20,000 Hz cannot be heard at all. To approximate the sensitivity of the human ear to changes in frequency, environmental sound is usually measured in what is referred to as A-weighted decibels (dBA). On this scale, the normal range of human hearing extends from about 10 dBA to about 140 dBA (EPA 1971). Common community noise sources and associated noise levels, in dBA, are depicted in **Figure 4.5-1**.

Addition of Decibels

Because decibels are logarithmic units, sound levels cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3 dB increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one automobile produces a sound level of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB; rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together would produce an increase of 5 dB.

FIGURE 4.5-1
COMMON NOISE LEVELS



Source: Caltrans 2011

Sound Propagation & Attenuation

Geometric Spreading

Sound from a localized source (i.e., a point source) propagates uniformly outward in a spherical pattern. The sound level decreases (attenuates) at a rate of approximately 6 decibels for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately 3 decibels for each doubling of distance from a line source, depending on ground surface characteristics. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water,), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver, such as soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 decibels per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation for soft surfaces results in an overall attenuation rate of 4.5 decibels per doubling of distance from the source.

Atmospheric Effects

Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) from the highway due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects.

Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receiver specifically to reduce noise. A barrier that breaks the line of sight between a source and a receiver will typically result in minimum 5 dB of noise reduction. Taller barriers provide increased noise reduction.

Noise reductions afforded by building construction can vary depending on construction materials and techniques. Standard construction practices typically provide approximately 15 dBA exterior-to-interior noise reductions for building facades, with windows open, and approximately 20–25 dBA with windows closed. With compliance with current Title 24 energy efficiency standards, which require increased building insulation and inclusion of an interior air ventilation system to allow windows on noise-impacted façades to remain closed, exterior-to-interior noise reductions typically average approximately 25 dBA. The absorptive characteristics of interior rooms, such as carpeted floors, draperies, and furniture, can result in further reductions in interior noise.

Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels. When community noise interferes with human activities or contributes to stress, public annoyance with the noise source increases. The acceptability of noise and the threat to public well-being are the basis for land use planning policies preventing exposure to excessive community noise levels.

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and habituation to noise over differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called "ambient" environment. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged. Regarding increases in A-weighted noise levels, knowledge of the following relationships will be helpful in understanding this analysis:

- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived by humans.
- Outside of the laboratory, a 3 dB change is considered a just-perceivable difference.
- A change in level of at least 5 dB is required before any noticeable change in community response would be expected. An increase of 5 dB is typically considered substantial.
- A 10 dB change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

A limitation of using a single noise-level increase value to evaluate noise impacts, as discussed above, is that it fails to account for pre-development noise conditions. With this in mind, the Federal Interagency Committee on Noise (FICON) developed guidance to be used for the assessment of project-generated increases in noise levels that take into account the ambient noise level. The FICON recommendations are based upon studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (i.e., CNEL, L_{dn}). FICON-recommended noise evaluation criteria are summarized in **Table 4.5-1**.

TABLE 4.5-1
FEDERAL INTERAGENCY COMMITTEE ON NOISE RECOMMENDED CRITERIA FOR EVALUATION OF INCREASES IN AMBIENT NOISE LEVELS

Ambient Noise Level Without Project	Increase Required for Significant Impact
< 60 dB	5.0 dB, or greater
60-65 dB	3.0 dB, or greater
> 65 dB	1.5 dB, or greater

Source: FICON 2000

As depicted in **Table 4.5-1**, an increase in the traffic noise level of 5.0, or greater, would typically be considered to result in increased levels of annoyance where existing ambient noise levels are less than 60 dB. Within areas where the ambient noise level ranges from 60 to 65 dB, increased levels of annoyance would be anticipated at increases of 3 dB, or greater. Increases of 1.5 dB, or greater, could result in increased levels of annoyance in areas where the ambient noise level exceeds 65 dB. The rationale for the FICON-recommended criteria is that as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause significant increases in annoyance (FICON 2000).

Effects of Noise on Human Activities

The extent to which environmental noise is deemed to result in increased levels of annoyance, activity interference, and sleep disruption varies greatly from individual to individual depending on various factors, including the loudness or suddenness of the noise, the information value of the noise (e.g., aircraft overflights, child crying, fire alarm), and an individual's sleep state and sleep habits. Over time, adaptation to noise events and to increased levels of noise may also occur. In terms of land use compatibility, environmental noise is often evaluated in terms of the potential for noise events to result in increased levels of annoyance, sleep disruption, or interference with speech communication, activities, and learning. Noise-related effects on human activities are discussed in more detail below.

Speech Communication

For most noise-sensitive land uses, an interior noise level of 45 dB L_{eq} is typically identified for the protection of speech communication in order to provide for 100 percent intelligibility of speech sounds. Assuming an average 20 dB reduction in sound level between outdoors and indoors (which is an average amount of sound attenuation that assumes windows are closed), this interior noise level would equates to an exterior noise level of 65 dBA L_{eq}. For outdoor voice communication, an exterior noise level of 60 dBA L_{eq} allows normal conversation at distances up to 2 meters with 95 percent sentence intelligibility (EPA 1971). Based on this information, speech interference begins to become a problem when steady noise levels reach approximately 60 to 65 dBA. Within interior noise environments, an average-hourly background noise level of 45 dBA L_{eq} is typically recommended for noise-sensitive land uses, such as educational facilities (Caltrans 2002).

Annoyance and Sleep Disruption

With regard to potential increases in annoyance, activity interference, and sleep disruption, land use compatibility determinations are typically based on the use of the cumulative noise exposure metrics (i.e., CNEL or L_{dn}). Perhaps the most comprehensive and widely accepted evaluation of the relationship between noise exposure and the extent of annoyance was one originally developed by Theodore J. Schultz in 1978. Schultz's research findings provided support for L_{dn} as the descriptor for environmental noise. Research conducted by Schultz identified a correlation between the cumulative noise exposure metric and individuals who were highly annoyed by transportation noise. When expressed graphically, this relationship is typically referred to as the Schultz curve. The Schultz curve indicates that approximately 13 percent of the population is highly annoyed at a noise level of 65 dBA L_{dn}. It also indicates that the percentage of people describing themselves as being highly annoyed accelerates smoothly between 55 and 70 dBA L_{dn}. A noise level of 65 dBA L_{dn} is a commonly referenced dividing point between lower and higher rates of people describing themselves as being highly annoyed (Caltrans 2002).

The Schultz curve and associated research became the basis for many of the noise criteria subsequently established for federal, state, and local entities. Most federal and State of California regulations and policies related to transportation noise sources establish a noise level of 65 dBA CNEL/L_{dn} as the basic limit of acceptable noise exposure for residential and other noise-sensitive land uses. For instance, with respect to aircraft noise, both the Federal Aviation Administration (FAA) and the State of California have identified a noise level of 65 dBA L_{dn} as the dividing point between normally compatible and normally incompatible residential land use generally applied for determination of land use compatibility. For noise-sensitive land uses exposed to aircraft noise, noise levels in excess of 65 dBA CNEL/L_{dn} are typically considered to result in a potentially significant increase in levels of annoyance (Caltrans 2002).

Allowing for an average exterior-to-interior noise reduction of 20 dB, an exterior noise level of 65 dBA CNEL/L_{dn} would equate to an interior noise level of 45 dBA CNEL/L_{dn}. An interior noise level of 45 dB CNEL/L_{dn} is generally considered sufficient to protect against activity interference at most noise-sensitive land uses, including residential dwellings, and would also be sufficient to protect against sleep interference (EPA 1971). In California, the California Building Code establishes a noise level of 45 dBA CNEL as the maximum acceptable interior noise level for residential uses (other than detached single-family dwellings). Use of the 45 dBA CNEL threshold is further supported by recommendations provided in the State of California Office of Planning and Research's General Plan Guidelines, which recommend an interior noise level of 45 dB CNEL/L_{dn} as the maximum allowable interior noise level sufficient to permit "normal residential activity" (OPR 2003).

The cumulative noise exposure metric is currently the only noise metric for which there is a substantial body of research data and regulatory guidance defining the relationship between noise exposure, people's reactions, and land use compatibility. However, when evaluating environmental noise impacts involving intermittent noise events, such as aircraft overflights and train passbys, the use of cumulative noise metrics may not provide a thorough understanding of the resultant impact. The general public often finds it difficult to understand the relationship between intermittent noise events and cumulative noise exposure metrics. In such instances, supplemental use of other noise metrics, such as the L_{eq} or L_{max} descriptor, may be helpful as a means of increasing public understanding regarding the relationship between these metrics and the extent of the resultant noise impact (Caltrans 2002).

AFFECTED ENVIRONMENT

The project area noise environment is defined primarily by vehicular traffic along State Route [SR] 4 and West Leland Road. To a lesser extent, on-site vehicle and bus operations at the Pittsburg/Bay Point BART Station, as well as material unloading activities at nearby commercial uses, also contribute on an intermittent basis to ambient noise levels in the Master Plan area.

Noise levels associated with Bay Area Rapid Transit (BART) trains, which travel within the center median of SR 4, are also detectable on an intermittent basis, but are largely masked by vehicle traffic on SR 4.

Nearby noise-sensitive land uses consist predominantly of single-family residential land uses located south of the Master Plan area, across West Leland Road. Multi-family residential land uses are located within the southwestern quadrant of the West Leland Road/Bailey Road intersection. Existing single-family residential land uses located adjacent to and south of West Leland Road are shielded from traffic noise by an existing masonry block sound barrier, approximately 6 feet in height.

To document existing ambient noise levels in the Master Plan area, short-term ambient noise measurements were conducted October 1–2, 2009, using a Larson Davis Laboratories, Type I, Model 820 integrating sound-level meter. The meter was calibrated before use and is certified to be in compliance with ANSI specifications. Measured ambient noise levels are summarized in **Table 4.5-2**. Based on the measurements conducted, average-hourly noise levels (in L_{eq}) within the Master Plan area are predominantly influenced by vehicle traffic on SR 4. Noise levels along the northern boundary of the Master Plan area, nearest SR 4, average approximately 78 dBA L_{eq}. Ambient noise levels along the southern boundary, which vary depending on site elevation in relation to West Leland Road, range from approximately 58 to 62 dBA L_{eq}. Maximum intermittent noise levels were also influenced predominantly by vehicle traffic on area roadways and ranged from approximately 88 dBA L_{max} along the northern Master Plan area boundary to approximately 72 dBA L_{max} along the southern boundary.

TABLE 4.5-2
SUMMARY OF MEASURED AMBIENT NOISE LEVELS

Location		Monitoring Period	Noise Levels (dBA)	
			L_{eq}	L_{max}
NM1	Pittsburg/Bay Point BART Station – Northern Boundary	4:30–4:45 PM	78.7	88.1
		10:00–10:15 PM	78.1	88.2
NM2	Pittsburg/ Bay Point BART Station – Western Boundary	4:55–5:10 PM	60.9	65.8
		10:20–10:30 PM	60.2	68.2
NM3	Pittsburg/ Bay Point BART Station – Southern Boundary	5:20–5:30 PM	56.4	66.7
		10:40–10:55 PM	55.4	65.9
NM4	Pittsburg/ Bay Point BART Station Master Plan – Southeastern Boundary	5:45–:00 PM	62.8	72.3
		11:05–11:15 PM	62.1	71.7
NM5	Pittsburg/ Bay Point BART Station Master Plan – Southwestern Boundary	6:15–6:30 PM	62.5	71.9
		11:15–11:25 PM	61.4	70.8

Ambient noise measurements were conducted October 1–2, 2009, using a Larson Davis Laboratories, Type I, Model 820 integrating sound-level meter. Primary noise sources influencing the ambient noise environment include vehicle traffic on area roadways, on-site parking lot and bus transit center operations, and BART rail operations located in the center median of SR 4.

Refer to **Figure 4.5-2** for corresponding measurement locations.

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Project Site Boundary

Existing Sound Barrier

\# Noise Monitoring Locations

Notes: Noise measurements were conducted on October 1-2, 2009 using a Larson Davis Type I, Model 820 sound-level meter. Measurement locations correspond to those depicted in Table 2.

Source: USGS 2009

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N

Figure 4.5-2

Ambient Noise Measurement Locations

PMC®

4.5.2 REGULATORY FRAMEWORK

LOCAL

City of Pittsburg General Plan

The General Plan serves as the overriding policy document for land use in the City of Pittsburg. **Table 4.5-3** below provides a list of all applicable noise-related policies and the proposed Master Plan's consistency with those goals and policies. While this DEIR analyzes the Master Plan's consistency with the General Plan pursuant to State CEQA Guidelines Section 15125(d), the Pittsburg City Council has the responsibility of ultimately determining the proposed Master Plan's consistency with the General Plan.

TABLE 4.5-3
PROJECT CONSISTENCY WITH APPLICABLE GENERAL PLAN NOISE POLICIES

General Plan Policies	Consistency with General Plan	Analysis
Policy 12-P-1 – As part of development review, use General Plan Figure 12-3 [**Figure 4.5-3** in this DEIR section] to determine acceptable uses and installation requirements in noise-impacted areas.	Yes, with Mitigation	Predicted noise levels at proposed land uses would exceed the City's land use compatibility noise standards. Mitigation measures MM 4.5.3b, c, and d have been incorporated to reduce noise levels at proposed on-site land uses to within conditionally acceptable levels. Acoustical analyses would be required for proposed residential land uses prior to project site development.
Policy 12-P-4 – Require noise attenuation programs for new development exposed to noise above normally acceptable levels. Encourage noise attenuation programs that avoid visible sound walls.	Yes	Refer to above response to General Plan Policy 12-P-1.
Policy 12-P-5 – Require that applicants for new noise-sensitive development, such as schools, residences, and hospitals, in areas subject to noise generators producing noise levels greater than 65 dB CNEL, obtain the services of a professional acoustical engineer to provide a technical analysis and design of mitigation measures.	Yes	Acoustical analyses would be required for proposed residential land uses prior to project site development.
Policy 12-P-6 – Ensure that new noise-sensitive uses, including schools, hospitals, churches, and homes, in areas near roadways identified as impacting sensitive receptors by producing noise levels greater than 65 dB CNEL (Figure 12-1), incorporate mitigation measures to ensure that interior noise levels do not exceed 45 dB CNEL.	Yes, with Mitigation	Refer to above response to General Plan Policy 12-P-1.
Policy 12-P-7:– Require the control of noise at the source through site design, building design, landscaping, hours of operation, and other techniques, for new development deemed to be noise generators.	Yes, with Mitigation	Refer to above response to General Plan Policy 12-P-1.

General Plan Policies	Consistency with General Plan	Analysis
Policy 12-P-8 – Develop noise attenuation programs for mitigation of noise adjacent to existing residential areas, including such measures as wider setbacks, intense landscaping, double-pane windows, and building orientation muffling the noise source.	Yes, with Mitigation	Refer to above response to General Plan Policy 12-P-1.
Policy 12-P-9 – Limit generation of loud noises on construction sites adjacent to existing development to normal business hours between 8:00 a.m. and 5:00 p.m.	Yes, with Mitigation	Mitigation measure MM 4.5.1 has been incorporated to limit construction activities to between the hours of 8:00 AM and 5:00 PM.
Policy 12-P-10 – Reduce the impact of truck traffic noise on residential areas by limiting such traffic to appropriate truck routes. Consider methods to restrict truck travel times in sensitive areas.	Yes, with Mitigation	Mitigation measure MM 4.5.3b has been incorporated to limit truck deliveries to proposed commercial, retail, and flex land uses to the less noise-sensitive daytime hours. In addition, acoustical analyses would also be required for proposed on-site residential land uses to ensure that future development would comply with City noise standards.

City of Pittsburg Municipal Code

The City of Pittsburg Municipal Code includes noise-related provisions for the control of stationary-source noise levels from existing uses located in Pittsburg. The following provisions pertain to the proposed plan:

> Section 9.44.010, Prohibitions.
>
> H. Exhausts. The discharge into the open air of the exhaust of any steam engine, motorboat, stationary internal combustion engine or motor vehicle, except through a muffler or other device which will effectively prevent loud or explosive noises there from.
>
> J. Pile Drivers, Hammers and Similar Equipment. The operation between the hours of 10:00 p.m. and 7:00 a.m. of any pile driver, steam shovel, pneumatic hammer, derrick, steam or electric hoist or other appliance, the use of which is attended by loud or unusual noise, except in case of emergency.
>
> Section 18.82.040, Noise.
>
> A. Each use and activity must comply with PMC Chapter 9.44.
>
> B. No construction event or activity occurring on any site adjoining a lot located in an R, residential PD or GQ district shall generate loud noises in excess of 65 decibels measured at the property line, except between the hours of 8:00 a.m. and 5:00 p.m.
>
> Section 15.88.060, Grading.
>
> 5. All grading and noise there from, including, but not limited to, warming of equipment motors in residential zones, or within 1,000 feet of any residential

occupancy, hotel, motel or hospital shall be limited between the hours of 7:00 a.m. and 5:30 p.m. weekdays, unless other hours are approved by the city engineer, upon receipt of evidence that an emergency exists which would constitute a hazard to persons or property.

Groundborne Vibration

There are no federal, state, or local regulatory standards for groundborne vibration. However, various criteria have been established to assist in the evaluation of vibration impacts. For instance, the California Department of Transportation (Caltrans) has developed vibration criteria based on potential structural damage risks and human annoyance. Caltrans-recommended criteria for the evaluation of groundborne vibration levels, with regard to structural damage and human annoyance, are summarized in **Table 4.5-4** and **Table 4.5-5**, respectively, seen under Standards of Significance below. The criteria differentiate between transient and continuous/frequent sources. Transient sources of ground-borne vibration include intermittent events, such as blasting; whereas, continuous and frequent events would include the operations of equipment, including construction equipment, and vehicle traffic on roadways (Caltrans 2002, 2004).

4.5.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Criteria for determining the significance of noise impacts were developed based on information contained in the California Environmental Quality Act Guidelines (CEQA Guidelines, Appendix G). According to those guidelines, a project may have a significant effect on the environment if it would result in the following conditions:

1) Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or of applicable standards of other agencies.

2) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

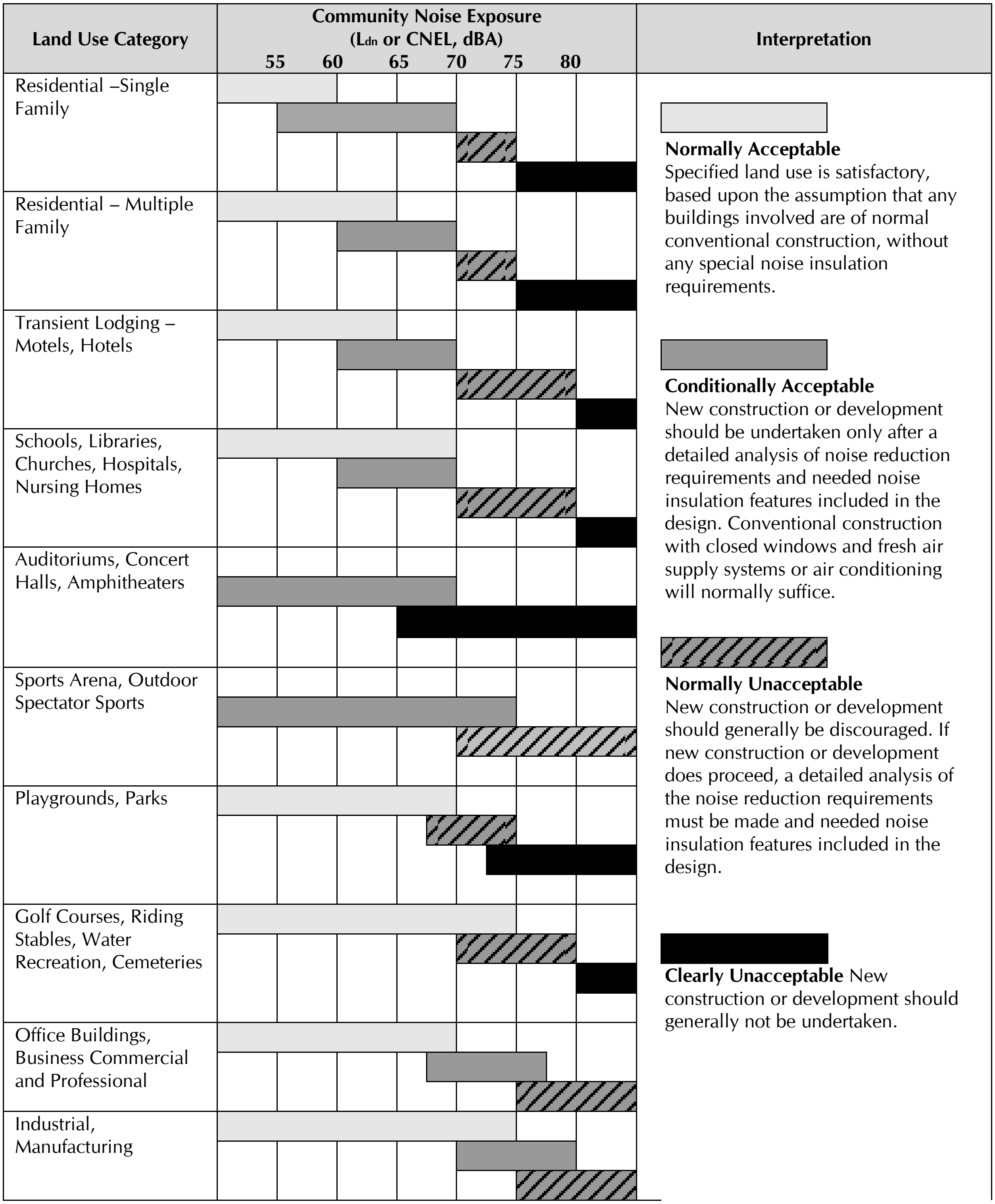
3) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

4) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

5) For a project located within an airport land use plan area or, where such a plan has not been adopted, within 2 miles of a public airport or a public use airport, exposure of people residing or working in the project area to excessive noise levels.

6) For a project within the vicinity of a private airstrip, exposure of people residing or working in the project area to excessive noise levels.

FIGURE 4.5-3
CITY OF PITTSBURG LAND USE COMPATIBILITY NOISE CRITERIA



Source: City of Pittsburg 2004

The nearest airport is Buchanan Field, which is located approximately 5.75 miles west of the Master Plan area in the City of Concord. The proposed project site is not located within 2 miles of a public airport or private airstrip, nor would implementation of the proposed Master Plan affect airport operations. For these reasons, exposure to aircraft noise levels would be considered less than significant and is not discussed further in this DEIR.

Temporary noise impacts associated with the proposed project would be associated with short-term construction-related activities. Long-term permanent increases in noise levels would occur associated with on-site operational activities, as well as potential increases in traffic noise levels along area roadways. Potential increases in groundborne vibration levels would be primarily associated with short-term construction-related activities. For purposes of this analysis and where applicable, the City of Pittsburg noise standards were used for evaluation of project-related noise impacts.

SHORT-TERM EXPOSURE TO PROJECT-GENERATED NOISE

Construction noise impacts would be considered significant if activities would violate City of Pittsburg Municipal Code requirements. The City's Municipal Code Noise Regulations typically restrict nuisance-related noise-generating construction activities that occur near noise-sensitive land uses to between the hours of 8:00 AM and 5:00 PM. Construction activities that occur during the nighttime hours must not exceed an exterior noise level of 65 dBA, measured at the property line. Grading activities are typically limited to between the hours of 7:00 AM and 5:30 PM on weekdays, unless additional hours are permitted by the city engineer. Pile driving and use of similar impact equipment is prohibited between the hours of 10:00 PM and 7:00 AM.

LONG-TERM EXPOSURE TO PROJECT-GENERATED NON-TRANSPORTATION NOISE

Long-term operational noise impacts would be considered significant if the proposed project would result in non-transportation noise levels that would exceed applicable City noise standards (**Figure 4.5-3**) at nearby noise-sensitive land uses. For residential land uses, the City's "normally acceptable" noise standard is 60 dBA CNEL/L_{dn}. Noise levels up to 70 dBA CNEL/L_{dn} are considered "conditionally acceptable," provided necessary noise-reduction measures have been incorporated and interior noise levels are within acceptable levels. However, with regard to non-transportation noise sources, average-daily noise standards may not provide adequate protection for noise-sensitive land uses, given that the operation of such sources is typically limited to shorter periods of time and often only during the daytime hours. The City's General Plan and Municipal Code do not specify noise standards for shorter periods of time, such as average-hourly noise standards. For purposes of this analysis, non-transportation noise sources would also be considered to have a potentially significant impact if project-generated non-transportation noise levels would exceed the normally applied average-hourly exterior and interior noise levels typically identified for maintaining speech communication and minimizing levels of annoyance and sleep disruption (i.e., 60 dBA L_{eq} and 45 dBA L_{eq}, respectively).

LONG-TERM INCREASES IN TRANSPORTATION NOISE

Long-term operational noise impacts would be considered significant if the proposed project would result in a substantial increase in ambient noise levels that would exceed the City noise standards (**Figure 4.5-3**). For purposes of this analysis, a substantial increase in noise levels is defined as an increase of 5.0 dBA, or greater, where the noise levels, without project implementation, are less than 60 dBA CNEL/L_{dn}; 3.0 dBA, or greater, where the noise level, without project implementation, ranges from 60 to 65 dBA CNEL/L_{dn}; and 1.5 dBA, or greater, where the noise level, without project implementation, exceeds 65 dBA CNEL/L_{dn}, based on the previously discussed FICON noise criteria (**Table 4.5-1**). The rationale for these noise criteria is that as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause a substantial increase in annoyance. As discussed above, substantial increase in noise levels that would also exceed applicable noise standards at primarily affected noise-sensitive land uses would be considered to have a significant impact.

EXPOSURE TO GROUNDBORNE VIBRATION

The groundborne vibration criteria recommended by Caltrans for evaluation of potential structural damage is based on building classifications, which take into account the age and condition of the building. For residential structures and newer buildings, Caltrans considers a minimum peak-particle velocity (ppv) threshold of 0.5 inches per second (in/sec) for transient sources and 0.3 in/sec for continuous/frequent sources to be sufficient to protect against building damage. With the exception of fragile buildings, ruins, and ancient monuments, continuous groundborne vibration levels below approximately 0.2 in/sec ppv are unlikely to cause structural damage. In terms of human annoyance, continuous vibrations in excess of 0.04 in/sec ppv and transient sources in excess of 0.25 in/sec ppv are identified by Caltrans as being "distinctly perceptible." Within buildings, short periods of groundborne vibration in excess of 0.2 in/sec ppv are generally considered to result in increased levels of annoyance (Caltrans 2002, 2004).

TABLE 4.5-4
DAMAGE POTENTIAL TO BUILDINGS AT VARIOUS GROUNDBORNE VIBRATION LEVELS

Structure and Condition	Vibration Level (in/sec ppv)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely Fragile Historic Buildings, Ruins, Ancient Monuments	0.12	0.08
Fragile Buildings	0.2	0.1
Historic and Some Old Buildings	0.5	0.25
Older Residential Structures	0.5	0.3
New Residential Structures	1.0	0.5
Modern Industrial/Commercial Buildings	2.0	0.5

Source: Caltrans 2002, 2004
Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

TABLE 4.5-5
ANNOYANCE POTENTIAL TO PEOPLE AT VARIOUS GROUNDBORNE VIBRATION LEVELS

Human Response	Vibration Level (in/sec ppv)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely Perceptible	0.04	0.01
Distinctly Perceptible	0.25	0.04
Strongly Perceptible	0.9	0.10
Severe	2.0	0.4

Source: Caltrans 2002, 2004
Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Groundborne vibration levels would be considered significant if predicted short-term construction or long-term operational groundborne vibration levels attributable to the proposed project would exceed recommended criteria (**Tables 4.5-4** and **4.5-5**) at nearby existing structures.

LAND USE COMPATIBILITY

Proposed land uses are evaluated in comparison to the City's General Plan noise standards for land use compatibility (**Figure 4.5-3**). Accordingly, residential land uses are considered normally acceptable within exterior noise environments up to 60 dBA CNEL/L_{dn} and conditionally acceptable at levels up to 70 dBA CNEL/L_{dn}. Commercial land uses and neighborhood parks are considered normally acceptable within exterior noise environments up to 70 dBA CNEL/L_{dn}. Commercial uses are considered conditionally acceptable at levels up to approximately 78 dBA CNEL/L_{dn}, and neighborhood parks are considered conditionally acceptable within exterior noise environments up to 75 dBA CNEL/L_{dn}.

METHODOLOGY

A combination of existing literature, noise level measurements, and application of accepted noise prediction and sound propagation algorithms was used for the prediction of short-term construction and long-term non-transportation and transportation source noise levels, as well as for the evaluation of groundborne vibration impacts.

Short-Term Construction Noise

Predicted noise levels at nearby noise-sensitive land uses were calculated utilizing typical noise levels and usage rates associated with construction equipment, derived from the U.S. Department of Transportation, Federal Highway Administration's Roadway Construction Noise Model (version 1.1). Construction noise levels were predicted assuming an average noise attenuation rate of 6 dB per doubling of distance from the source.

Non-Transportation Noise

Noise levels associated with on-site transit operations and the proposed parking garages were calculated using methodologies obtained from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment (2006) guidelines. Given that development of the proposed land uses would occur in multiple phases over a period of years and to ensure a conservative analysis, an approximate 35 percent increase in bus operations was applied based on the projected increase in future BART ridership (i.e., an increase of 9 buses per hour during the daytime hours and 4 buses per hour during the nighttime hours). Under future conditions, an average of approximately 34 buses per hour during the daytime and 13 buses per hour during the nighttime were assumed to access the site. Predicted noise levels associated with non-transportation noise sources associated with proposed on-site commercial, retail, and flex uses were calculated based on representative data obtained from existing literature, as well as noise measurement data obtained from similar uses. Modeling assumptions and calculations are included in **Appendix D**.

Transportation Noise

Traffic noise levels were calculated using the Federal Highway Administration (FHWA) roadway noise prediction model (FHWA-RD-77-108) based on California vehicle reference noise levels and traffic data obtained from the traffic analysis prepared for the proposed Master Plan project. Traffic volumes were calculated assuming that peak-hour volumes represent 10 percent of the average-daily volumes. Additional input data included day/night percentages of autos, medium and heavy trucks, vehicle speeds, ground attenuation factors, and roadway widths. Predicted noise levels were calculated at a distance of 50 feet from the near-travel-lane centerline, as well as distances to the predicted noise contours. Increases in traffic noise levels attributable to the proposed project were determined based on a comparison of predicted noise levels, with and without project implementation.

Operational noise levels for BART rail operations, located in the center median of SR 4, were calculated in accordance with the FTA Noise and Groundborne Vibration Impact Assessment (2006) guidelines and including the predicted noise levels/contours for SR 4. In comparison to existing operations, the number of predicted future BART train operations was assumed to increase by approximately 35 percent through year 2030, based on predicted increases in future BART ridership (Fehr & Peers 2011). Based on this assumption and to ensure a more conservative analysis, the number of daily trains for future operational conditions was increased by 35 percent to account for potential increases in transit demand for future years. Predicted BART rail noise levels were calculated assuming an average of approximately 134 trains per day for future operations. Additional modeling parameters assumed an average approach/departure train speed of 40 miles per hour (mph), an average of 10 cars per train, and welded track conditions. The sounding of transit warning devices was included. Modeling assumptions and calculations are included in **Appendix D**.

The compatibility of proposed land uses was evaluated based on projected future on-site transportation noise levels, with project implementation. Predicted on-site noise levels were compared with the City's corresponding noise criteria for determination of land use compatibility (**Figure 4.5-3**).

Groundborne Vibration

Groundborne vibration levels associated with construction-related activities were evaluated utilizing typical groundborne vibration levels rates associated with construction equipment, obtained from the U.S. Department of Transportation, Federal Transit Administration's Transit Noise and Vibration Impact Assessment (2006) guidelines. Groundborne vibration impacts related to structural damage and human annoyance were evaluated, taking into account the distance from construction activities to nearby land uses and typically applied criteria for structural damage and human annoyance (**Tables 4.5-4** and **4.5-5**).

IMPACTS AND MITIGATION MEASURES

Exposure to Construction Noise

Impact 4.5.1 Short-term construction activities could result in a substantial temporary increase in ambient noise levels at nearby noise-sensitive land uses, which may result in increased levels of annoyance, activity interference, and sleep disruption. This impact is considered **potentially significant**.

Although the proposed Master Plan does not include any specific development proposals, it would allow for the future construction of a mixed-use transit-oriented development within the area currently occupied by the parking lot and bus transit center that serves the Pittsburg/Bay Point BART Station and adjacent vacant land. Construction noise associated with future development would be temporary and would vary depending on the nature of the construction activities being performed. Noise generated during construction is typically associated with the operation of off-road equipment, including excavation equipment, material handlers, and portable generators.

Table 4.5-6 lists typical uncontrolled noise levels generated by individual pieces of representative construction equipment likely to be used during construction. Noise levels associated with individual construction equipment typically range from approximately to 74 to 89 dBA L_{max}. Noise from localized point sources, such as construction sites, typically decreases by approximately 6 dBA with each doubling of distance from source to receptor. Given this noise attenuation rate and typical construction equipment noise levels and usage rates, combined noise levels associated with construction activities can reach levels of up to approximately 84 dBA L_{eq} at 50 feet. Depending on the construction activities conducted, construction-generated noise levels at nearby existing residential land uses could reach levels of approximately 78 dBA L_{eq} for brief periods of time.

With regard to residential land uses, noise levels associated with construction activities occurring during the more noise-sensitive nighttime hours (i.e., 10 PM to 7 AM) are of increased concern. Because exterior ambient noise levels typically decrease during the nighttime hours as community activities (e.g., commercial activities, vehicle traffic) decrease, construction activities performed during these more noise-sensitive periods of the day can result in increased annoyance and potential sleep disruption for occupants of nearby residential dwellings. As a result, short-term noise-generating construction activities associated with future development would be considered to have a **significant** impact.

Mitigation Measures

MM 4.5.1 All future development in the Master Plan Area shall conform to the following noise requirements:

a. Construction activities (excluding activities that would result in a safety concern to the public or construction workers) shall be limited to between the hours of 8:00 AM and 5:00 PM on weekdays, or as approved by the

City Engineer. Construction activities shall be prohibited on federal holidays.

b. Construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and shrouds, in accordance with manufacturers' recommendations. In the absence of manufacturers' recommendations, the Director of Public Works may prescribe such means of achieving maximum noise attenuation.

c. Construction equipment staging areas shall be located at the furthest distance possible from nearby noise-sensitive land uses.

d. All motorized construction equipment and vehicles shall be turned off when not in use.

Timing/Implementation: *Prior to and during construction*

Enforcement/Monitoring: *City of Pittsburg Development Services Department*

Implementation of mitigation measure **MM 4.5.1** would limit construction activities to the less noise-sensitive periods of the day and would require the use of mufflers that would reduce individual equipment noise levels by approximately 10 dBA. With implementation of the above mitigation measure, and considering that construction noise impacts are by their nature temporary in nature, noise-generating construction activities would comply with the City's Municipal Code and would be considered **less than significant**.

TABLE 4.5-6
TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS

Equipment	Typical Noise Level (dBA Lmax) 50 feet from Source
Air Compressor	81
Backhoe	80
Compactor	82
Dozer/Grader/Front-End Loader	85
Concrete Mixer	85
Concrete Pump	82
Crane, Mobile	83
Generator	81
Jack Hammer	88
Paver	89
Roller	74
Saw	76

Sources: FTA 2006

Increases in Traffic Noise

Impact 4.5.2 Implementation of the proposed project would not result in a significant increase in traffic noise levels at nearby noise-sensitive receptors. This impact would be considered **less than significant**.

Implementation of the proposed project would allow for the future development of land uses that would result in increased traffic volumes on some area roadways. The increase in traffic volumes resulting from implementation of the proposed project would therefore contribute to predicted increases in traffic noise levels. The FHWA roadway noise prediction model was used to predict traffic noise levels along primarily affected roadway segments, with and without implementation of the proposed project. The proposed Master Plan's contribution to traffic noise levels along area roadways was determined by comparing the predicted noise levels with and without project-generated traffic as discussed in more detail below.

Predicted traffic noise levels, with and without development of the proposed Master Plan, are summarized in **Table 4.5-7**. As depicted, increases in traffic noise levels along area roadways attributable to the proposed project would range from approximately 0.8 to 1.03 dB along Bailey Road and approximately 0.02 to 1.8 dB along West Leland Road. The proposed Master Plan would not result in a substantial increase in traffic noise levels along primarily affected area roadways. In addition, as discussed earlier, increases of less than 3 dB would not be discernible to the human ear. As a result, increases in traffic noise levels attributable to the proposed project would be considered **less than significant**.

TABLE 4.5-7
PREDICTED INCREASES IN TRAFFIC NOISE LEVELS – EXISTING CONDITIONS

Roadway	CNEL/Ldn at 50 Feet from Near-Travel-Lane Centerline1		Predicted Increase	Substantial Increase?[2]
	Without Project	With Project		
Bailey Road, North of West Leland Road	63.29	64.32	1.03	No
Bailey Road, South of West Leland Road	60.03	60.83	0.80	No
West Leland Road, East of Bailey Road	64.96	65.18	0.22	No
West Leland Road, Bailey Road to Oak Hills Drive	62.45	64.23	1.78	No
West Leland Road, Oak Hills Drive to East BART Driveway	61.86	62.41	0.55	No
West Leland Road, East BART Driveway to West BART Driveway	61.99	62.02	0.03	No
West Leland Road, West BART Driveway to Woodhill Drive	60.42	61.82	1.40	No
West Leland Road, Woodhill Drive to Alves Ranch Drive	63.91	65.14	1.23	No

Notes: 1. Traffic noise levels were calculated using the FHWA roadway noise prediction model.
2. Substantial increases defined as an increase of 5.0 dBA, or greater, where noise levels are less than 60 dBA CNEL; 3.0 dBA, or greater, where noise levels range from 60 to 65 dBA CNEL; and 1.5 dB, or greater, where the noise level exceeds 65 dBA CNE,L without the proposed project.

Mitigation Measures

None required.

Exposure to Non-Transportation Source Noise

Impact 4.5.3 Implementation of the proposed project may result in non-transportation noise levels that could exceed applicable noise thresholds at nearby proposed land uses. This impact would be considered **potentially significant**.

Although the proposed Master Plan does not include any specific development proposals, it would allow for the future construction of a mixed-use transit-oriented development within the area occupied by the existing parking lot that currently serves the Pittsburg/Bay Point BART Station and adjacent vacant land. The proposed project would allow for the construction of two multi-story parking structures, a mix of commercial and retail development to support BART patrons, and medium- and high-density residential land uses. Long-term noise impacts associated with the existing on-site bus transit operations, as well as with the proposed on-site land uses, are discussed in more detail below.

Bus Transit Center and Parking Garages

Noise associated with bus transit centers typically includes exhaust noise during acceleration of buses, air brake decompression, brake squeal, the opening and closing of doors, and people talking. Parking lots and garages can also result in increased noise levels due to vehicle activities conducted in these areas. Maximum single-event noise levels associated with bus transit centers can reach approximately 82–101 dBA for short periods of time (FTA 2006).

As discussed earlier, the number of buses accessing the facility on a daily basis typically average approximately 25 buses per hour during the daytime hours (i.e., 7 AM to 10 PM) and approximately 9 buses per hour during the early morning and nighttime hours of operation (i.e., 10 PM to midnight and 4 AM to 7 AM). By year 2030, BART ridership is projected to increase by approximately 35 percent (see Section 4.4, Transportation and Traffic). Given that development of the proposed land uses would occur in multiple phases over a period of years and to ensure a conservative analysis, an approximate 35 percent increase in bus operations was applied based on the projected increase in future BART ridership (i.e., an increase of 9 buses per hour during the daytime hours and 4 buses per hour during the nighttime hours). Under future conditions, an average of approximately 34 buses per hour during the daytime and 13 buses per hour during the nighttime were assumed to access the site. Given that the precise locations of planned residential land uses and associated outdoor activity areas are not known at this time, this analysis conservatively relies on predicted noise levels at the boundaries of the proposed development phases for determination of impacts to planned residential land uses. Predicted operational noise levels at nearby proposed land uses are summarized in **Table 4.5-8**.

Based on the modeling conducted, exterior daytime operational noise levels at proposed residential land uses located within approximately 100 feet of the bus transit center and within approximately 60 feet of the proposed parking structures could exceed the exterior noise threshold of 60 dBA CNEL/L_{eq}. Operational noise levels during the nighttime hours are projected to decrease, due to decreased on-site bus operations and vehicle traffic utilizing the proposed parking garages. However, predicted nighttime operational noise levels at residential land uses located in Phase 1 of the Master Plan area, within 100 feet of the bus transit center, could still exceed the 60 dBA L_{eq} threshold. As noted in **Table 4.5-8**, combined operational noise levels for the bus transit center and the proposed parking garages would be projected to exceed exterior noise thresholds at proposed residential land uses located within Phase 1, Phase 4, and Phase 5 of the Master Plan area, as well as at the proposed community park.

Based on the predicted exterior noise levels discussed above and assuming an average exterior-to-interior noise reduction of 20 dBA, predicted daytime average-hourly interior noise levels at the nearest residential land uses located in Phase 1 of the Master Plan area could reach levels of approximately 49 dBA L_{eq}. Predicted average-daily interior noise levels at these same residences would be approximately 51 dBA CNEL/L_{dn}, which would exceed the 45 dBA CNEL threshold. Predicted interior noise levels at the remaining proposed residential land uses due to on-site bus transit center and parking garage operations would not be projected to exceed the commonly applied interior noise thresholds (i.e., 45 dBA CNEL/L_{eq}).

It is important to note, however, that operational noise levels associated with on-site bus transit center and parking garage operations would be largely masked by existing roadway traffic noise levels. However, depending on the distance and orientation of proposed noise-sensitive land uses, site design, and intervening shielding provided by on-site structures, predicted operational noise levels would still be detectable at some on-site land uses, particularly those located within approximately 100 feet of the transit bus center or within 60 feet of the proposed parking garages. For these reasons, exposure to operational noise for the bus transit center and proposed parking garages would be considered **significant**.

TABLE 4.5-8
PREDICTED BUS TRANSIT CENTER AND PARKING GARAGE NOISE LEVELS AT PROPOSED NOISE-SENSITIVE LAND USES

Plan Phase	Proposed Land Use	Predicted Exterior Noise Levels (dBA)[1]			Predicted Interior Noise Levels (dBA)[1,2]		
		Daytime Avg-Hourly (Leq)	Nighttime Avg-Hourly (Leq)	Average Daily (CNEL/Ldn)	Daytime Avg-Hourly (Leq)	Nighttime Avg-Hourly (Leq)	Average Daily (CNEL/Ldn)
Combined Noise Levels (Bus Transit Center, Parking Garage 1, and Parking Garage 2)							
1	Senior & Market-Rate Housing	**69**	**64**	**71**	**49**	44	**51**
4	High-Density Residential	**61**	58	**64**	41	38	44
5	High-Density Residential/Community Park	**60**	58	**64**	40	38	44
6	High-Density Residential	51	45	52	31	25	32
Exceeds Corresponding Exterior/Interior Noise Thresholds at Proposed Noise-Sensitive Land Uses?[3]		**Yes**	**Yes**	**Yes**	**Yes**	No	**Yes**

*Notes: Predicted transit noise levels were calculated in accordance with FTA-recommended methodology (2006). Assumes an average of 34 buses per hour during daytime operations and 13 buses per hour during nighttime operations, based on a projected increase in BART ridership through year 2030 of approximately 35 percent. Refer to **Appendix D** for modeling assumptions and results.*
1. Represents combined noise levels associated with parking garages and bus transit center operations.
2. To be conservative, assumes a minimum average exterior-to-interior noise reduction of 20 dBA. Actual noise level reductions will vary depending on the method and type of materials used during construction. Based on current building practices, average exterior-to-interior noise reductions can range from 20 to 30 dBA.
3. Based on corresponding exterior noise thresholds of 60 dBA CNEL/Leq and interior noise thresholds of 45 dBA CNEL/Leq. Predicted noise levels that exceed corresponding noise thresholds are depicted in bold font.

Retail, Commercial, and Flex Land Uses

Daily maintenance and operational activities associated with the proposed retail and commercial land uses could result in increases in ambient noise levels, primarily associated with the operation of mechanical building equipment and the operation of delivery and maintenance vehicles, as well as waste collection activities. Noise-generating activities would occur on an intermittent basis, primarily during the day and evening hours and less frequently at night. Noise-generating mechanical equipment associated with commercial and office land uses typically include air and water circulation systems (e.g., heating, ventilation, and air conditioning systems, and boilers). In general, noise levels generated by such systems typically average between 55 and 85 dBA at 3 feet from the source (EPA 1971). Mechanical equipment is typically shielded from direct public exposure and usually housed on rooftops, within equipment rooms, or within exterior enclosures. Material loading and unloading activities can generate noise level of up to 65 dBA L_{eq} at 50 feet. Depending on site design and the specific commercial uses proposed, predicted operational noise levels at nearby proposed land uses could result in a significant increase in ambient noise levels that exceed exterior and interior noise thresholds (i.e., 60 dBA and 45 dBA CNEL/L_{eq}, respectively). As a result, exposure to operational noise generated by the proposed retail, commercial, and flex land uses would be considered **significant**.

Proposed Residential Land Uses

Stationary-source noise associated with residential development is primarily connected with the operation of landscape maintenance equipment and central air conditioning units. To a lesser extent, vehicle noise and amplified music would also contribute to intermittent increases in ambient noise levels. However, increases in ambient noise levels from such sources are often sporadic and are typically limited to the less noise-sensitive daytime hours. Implementation of the proposed project would not result in the operation of any major on-site stationary noise sources within residential areas. Operational non-transportation noise impacts associated with proposed residential land uses would therefore be considered **less than significant**.

Proposed Neighborhood Park

The proposed project includes development of an approximately 0.4-acre neighborhood park. The specific facilities to be included in the proposed park have not yet been identified. However, small neighborhood parks typically include playgrounds, picnic areas, and general-purpose open space areas. Noise generated at neighborhood parks is primarily associated with landscape maintenance activities. Landscape maintenance activities would be intermittent and primarily occur during the less noise-sensitive daytime hours. Operational non-transportation noise impacts associated with proposed neighborhood park would be considered **less than significant**.

Mitigation Measures

MM 4.5.3a Prior to construction of any parking garages, BART or their assigned agent or developer shall undertake one of the two options:

a. Provide increased noise shielding for planned adjacent residential land uses. The proposed multi-story parking garages shall be designed and constructed so that the façades of the parking structure facing nearby noise-sensitive land uses are of solid construction, sufficient to shield line-of-sight between interior parking areas and outdoor activity areas of the adjacent planned residential land uses. To effectively reduce sound transmission, the material chosen must be rigid and sufficiently dense (at least 4 lbs/square foot [20 kilograms/square meter]). Furthermore, planned residential land uses located within 75 feet of the bus transit center and proposed parking garages shall be designed and constructed so that exterior activity areas (e.g., courtyards, patios, private areas) are shielded from direct line-of-sight of the bus transit center and proposed parking garages.

-OR-

b. An acoustical analysis shall be prepared for each of the proposed parking structures once more detailed design-related information for the proposed parking structure and/or adjacent planned residential land uses becomes available. The acoustical analysis shall identify noise control devices (e.g., barriers, acoustical vents and screens), to ensure that predicted noise levels at the adjacent planned residential land uses would not exceed acceptable levels.

Timing/Implementation: *Prior to approval or issuance of any grading or construction permits for the parking garages*

Enforcement/Monitoring: *City of Pittsburg Development Services Department*

MM 4.5.3b All loading and unloading activities for proposed on-site commercial and retail land uses, including waste collection activities, shall be limited to between the hours of 7:00 AM and 10:00 PM.

Timing/Implementation: *As a Condition of Approval for any building or development permits*

Enforcement/Monitoring: *City of Pittsburg Development Services Department*

MM 4.5.3c All proposed residential land uses shall comply with California Code of Regulations Title 24 noise standards for allowable interior noise levels (California Building Code, 1998 edition, Volume 1, Appendix Chapter 12, Section 1208A). An acoustical study shall be prepared by a qualified professional demonstrating compliance with applicable interior noise standard of 45 dBA CNEL in habitable rooms.

Timing/Implementation: *As a Condition of Approval for any building or development permits.*

Enforcement/Monitoring: *City of Pittsburg Development Services Department*

MM 4.5.3d All proposed commercial, retail, flex, and residential land uses shall be equipped with fresh air supply systems or air conditioning systems to allow windows to remain closed during inclement weather conditions.

Timing/Implementation: *As a Condition of Approval for any building or development permits.*

Enforcement/Monitoring: *City of Pittsburg Development Services Department*

With mitigation, an acoustical analysis would be required for proposed residential land uses to ensure that interior noise levels would not exceed applicable noise standards. Based on predicted traffic noise levels on the project site, compliance with Title 24 noise standards would require that proposed residential dwellings achieve average exterior-to-interior noise reductions of approximately 25–30 dBA, depending on location and site design. With compliance with Title 24 noise standards, predicted interior noise levels at proposed residential dwellings would not exceed applicable hourly or daily thresholds. To minimize potential increases in annoyance and sleep disruption to occupants of nearby dwellings, additional measures have been included to prohibit noise-generating commercial and retail activities from occurring during the more noise-sensitive nighttime hours. With mitigation, operational noise levels at on-site land uses would comply with the City's conditionally acceptable noise standards. This impact would be considered **less than significant**.

Land Use Compatibility

Impact 4.5.4 Projected on-site noise levels at proposed on-site land uses would exceed the City's normally acceptable noise exposure standards for land use compatibility. As a result, this impact is considered **potentially significant**.

The compatibility of proposed land uses is evaluated based on a comparison of predicted future cumulative traffic noise levels at the site to the City's General Plan exterior noise standards (**Figure 4.5-3**). According to the City's General Plan noise standards for land use compatibility, residential land uses are considered normally acceptable within exterior noise environments up to 60 dBA CNEL/L_{dn}. Accordingly, residential land uses are considered normally acceptable within exterior noise environments up to 60 dBA CNEL/L_{dn} and conditionally acceptable at levels up to 70 dBA CNEL/L_{dn}. Commercial land uses and neighborhood parks are considered normally acceptable within exterior noise environments up to 70 dBA CNEL/L_{dn}. Commercial uses are considered conditionally acceptable at levels up to approximately 78 dBA CNEL/L_{dn}, and neighborhood parks are considered conditionally acceptable within exterior noise environments up to 75 dBA CNEL/L_{dn}.

As noted previously, noise levels within the Master Plan area are predominantly influenced by vehicle traffic noise from SR 4. To a lesser extent, noise generated by rail operations of BART, which is located within the center median of SR 4, vehicle traffic on West Leland Road, and onsite vehicle traffic would also contribute to the projected future noise environment. Predicted future cumulative transportation noise levels for these sources, with implementation of the proposed project, were calculated using the FHWA roadway noise prediction model (FHWA-RD-77-108) based on California vehicle reference noise levels and traffic data obtained from the traffic analysis prepared for the proposed Master Plan. In comparison to existing operations, the number of predicted future BART train operations was assumed to increase by approximately 35 percent through year 2030, based on predicted increases in future BART ridership (see Section 4.4, Transportation and Traffic). Operational noise levels for BART rail operations were calculated in accordance with FTA Noise and Groundborne Vibration Impact Assessment (2006) guidelines and included in the predicted noise levels/contours for SR 4. Predicted distance to future cumulative traffic noise levels is summarized in **Table 4.5-9**. Based on the modeling conducted, the entire Master Plan area would be located with the projected 65 dBA CNEL/L_{dn} contour of SR

4 and West Leland Road. In addition, the projected 70 dBA CNEL/L_{dn} transportation noise contour for SR 4 would extend to approximately 495 feet from the northern boundary of the Master Plan area. The predicted traffic noise levels for proposed on-site roadways, including A Street, B Street, C Street, and D Street, would be approximately 60 dBA CNEL/L_{dn}, or less, at 50 feet from the near-travel-lane centerline and would not result in a substantial contribution to predicted on-site noise levels. Predicted future on-site noise levels would exceed the City's normally acceptable noise standard of 60 dBA CNEL/L_{dn} at proposed on-site land uses. Predicted future noise levels at commercial and retail uses located within the northern portion of the Master Plan area, within approximately 495 feet of the northern boundary of the Master Plan area, would also be projected to exceed the City's normally acceptable noise standard of 70 dBA CNEL/L_{dn}. As a result, this impact would be considered **significant**.

TABLE 4.5-9
PREDICTED FUTURE TRAFFIC NOISE LEVELS & DISTANCES TO CONTOURS

Segment	ADT	CNEL/Ldn at 50 Feet from Near-Travel-Lane Centerline	Distance (feet) to CNEL/Ldn Contours from Roadway Centerline		
			60	65	70
Off-Site Transportation Noise Sources					
Highway 4, West of Bailey Road[1]	170,000	81.45	2,652	1,233	576
West Leland Road, Bailey Road to Oak Hills Drive	42,080	67.32	217	103	WR
West Leland Road, Oak Hills Drive to East BART Driveway	37,910	66.87	202	96	WR
West Leland Road, East BART Driveway to West BART Driveway	33,730	66.36	187	90	WR
West Leland Road, West BART Driveway to Woodhill Drive	32,150	66.15	182	87	WR
On-site Transportation Noise Sources					
A Street, North of West Leland Road	1,090	52.7	WR		
B Street, North of West Leland Road	230	50.9	WR		
C Street, North of West Leland Road	4,750	56.7	WR		
D Street, North of West Leland Road[2]	1,960	59.9	WR		

Source: AMBIENT 2011
Notes: WR = Within Roadway Right-of-Way.
1. Includes vehicle traffic on SR 4 and BART rail operations. Assumes an average of approximately 134 trains per day for future weekday operations.
2. Includes transit bus operations. Assumes an approximate 35 percent increase in bus operations, in comparison to existing conditions, based on projected future increases in BART ridership through year 2030. Assumes future bus operations would average approximately 585 buses per day. Reader is referred to Appendix D for modeling assumptions and results.

Mitigation Measures

Implementation of mitigation measures **MM 4.5.3a** through **MM 4.5.3d** would ensure that operational noise levels at on-site land uses would comply with the City's conditionally acceptable noise standards. Therefore, this impact would be reduced to a **less than significant** level.

Exposure to Groundborne Vibration

Impact 4.5.5 Groundborne vibration levels associated with pile-driving activities, if required, could exceed applicable groundborne vibration criterion at nearby land uses. This impact would be **potentially significant**.

Ground vibration spreads through the ground and diminishes in strength with distance. The effects of ground vibration can vary from no perceptible effects at the lowest levels, low rumbling sounds and detectable vibrations at moderate levels, and slight damage to nearby structures at the highest levels. At the highest levels of vibration, damage to structures is primarily architectural (e.g., loosening and cracking of plaster or stucco coatings) and rarely results in structural damage. For most structures, a peak particle velocity (ppv) threshold of 0.5 inches per second (in/sec) is sufficient to avoid structure damage, with the exception of fragile historic structures or ruins. For the protection of fragile, historic, and residential structures, Caltrans recommends a more conservative threshold of 0.2 inches per second ppv. This same threshold would represent the level at which vibrations would be potentially annoying to people in buildings (FTA 2006; Caltrans 2002).

Long-term operational activities associated with the proposed project would not involve the use of any equipment or processes that would result in potentially significant levels of ground vibration. Increases in groundborne vibration levels attributable to the proposed project would be primarily associated with short-term construction-related activities. Groundborne vibration levels associated with construction equipment are summarized in **Table 4.5-10**. Construction activities associated with the proposed improvements would likely require the use of various tractors, trucks, and jackhammers. Pile drivers may also be required during construction of the proposed parking garages.

TABLE 4.5-10
REPRESENTATIVE CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Equipment	Peak Particle Velocity at 25 Feet (in/sec ppv)
Impact Pile Driver (Upper Range)	1.518
Impact Pile Driver (Typical)	0.644
Sonic Pile Driver (Upper Range)	0.734
Sonic Pile Driver (Typical)	0.17
Vibratory Roller	0.21
Large Tractors	0.089
Caisson Drilling	0.089
Loaded Trucks	0.076
Jackhammer	0.035
Small Tractors	0.003

Source: Caltrans 2004; FTA 2006

Based on the vibration levels presented in **Table 4.5-10**, ground vibration generated by most off-road construction equipment, such as tractors, trucks, and tractors, would be less than 0.09 inches per second ppv at 25 feet and would not pose a significant risk to nearby structures or occupants. However, in the event that pile driving would be required for construction of the proposed parking garages, detectable increases in groundborne vibration levels at off-site locations could potentially occur. Groundborne vibration levels would depend on the specific equipment being used, the distance from the source to the receptor, and soil conditions. To be conservative, and given that the specific type of equipment to be used during construction has not yet been determined, vibration levels associated with potential pile-driving activities were calculated based on the upper-range levels associated with impact pile drivers (i.e., 1.518 in/sec ppv at 25 feet). Based on this upper range of vibration levels and conservative assumptions for ground attenuation rates, structures located within 75 feet of pile-driving activities could potentially exceed the commonly applied threshold of 0.5 in/sec ppv for structural damage. In addition, land uses located within approximately 160 feet of impact pile-driving activities could also exceed commonly applied thresholds for human annoyance (i.e., 0.2 in/sec ppv). Potential groundborne vibration levels and impacts associated with the construction of the proposed parking garages are discussed in greater detail below.

Parking Garage 1

The proposed Parking Garage 1 would be located near the northeastern boundary of the Master Plan area and would be constructed during the second phase of development. The nearest existing structures include commercial retail uses located approximately 65 feet east of the site, within the Oak Hills Shopping Center, and the BART transit station, which is located in the center median of SR 4, approximately 270 feet north of the proposed parking garage. In addition, Phase 1 of the proposed Master Plan would include the development of mixed retail, flex, and residential land uses. These land uses would be located approximately 150 feet west of the proposed Parking Garage 1.

Assuming a maximum pile-driving vibration level of 1.518 in/sec ppv and the distances noted above, predicted groundborne vibration levels at the nearest existing commercial retail structures within the Oak Hills Shopping Center would be approximately 0.53 in/sec ppv, or less. Predicted groundborne vibration levels at the BART transit station would be approximately 0.11 in/sec ppv. Groundborne vibration levels at the proposed Phase 1 land uses could reach levels of approximately 0.21 in/sec ppv. Predicted groundborne vibration levels at the nearest commercial retail structures could potentially exceed the commonly applied threshold of 0.5 in/sec ppv for structural damage. As noted above, structural damage at these levels would be primarily associated with some loosening and cracking of plaster or stucco coatings. In addition, predicted groundborne vibration levels at these same commercial retail uses, as well as the proposed Phase 1 development, could also exceed commonly applied thresholds for human annoyance (i.e., 0.2 in/sec ppv). Construction of the proposed Parking Garage 1 would therefore be considered to have a **significant** impact.

Parking Garage 2

The proposed Parking Garage 2 would be located within the southeast quadrant of the Main Street and C Street intersection, approximately 75 feet north of West Leland Road. Parking Garage 2 would be constructed during the third phase of development. The nearest existing structures include residential dwellings located approximately 175 feet to the south, across West Leland Road, and commercial-retail structures located approximately 275 feet to the east, within the Oak Hills Shopping Center. As noted above, Phase 1 of the proposed Master Plan would include the development of a mix of retail, flex, and residential housing, which would be located approximately 75 feet north of the proposed Parking Garage 2.

Assuming a maximum pile-driving vibration level of 1.518 in/sec ppv and the distances noted above, predicted groundborne vibration levels at the nearest existing residential land uses located south of West Leland Road would be approximately 0.18 in/sec ppv, or less. Predicted groundborne vibration levels at the nearest commercial structures within the Oak Hills Shopping Center would be approximately 0.11 in/sec ppv. Groundborne vibration levels at the proposed Phase 1 land uses could reach levels of approximately 0.45 in/sec ppv. Predicted groundborne vibration levels at nearby existing structures would not be predicted to exceed commonly applied thresholds. However, predicted groundborne vibration levels at structures located within Phase 1 of the proposed Master Plan development could potentially exceed the commonly applied threshold for human annoyance (i.e., 0.2 in/sec ppv). Construction of the proposed Parking Garage 2 would therefore be considered to have a **significant** impact.

Mitigation Measures

MM 4.5.5 Impact pile-driving equipment used within 160 feet of nearby structures shall be substituted with equipment or procedures that would generate lower levels of groundborne vibration, to the extent that geological conditions would permit their use. For instance, in comparison to impact pile drivers, drilled piles or the use of a sonic or vibratory pile drivers are preferred alternatives. In the event that the use of impact pile drivers is required due to geological conditions, groundborne vibration monitoring shall be conducted for impact pile driving that occurs within 160 feet of existing structures. Pile-driving activities shall be suspended if measured groundborne vibration levels approach within 0.1 in/sec ppv of commonly applied threshold of 0.5 in/sec ppv for structural damage. In such instances, additional attenuation measures or changes in pile-driving techniques shall be implemented, prior to recommencing pile-driving activities, to reduce groundborne vibration levels. For impact pile-driving activities that occur within approximately 75 feet of existing structures, a building conditions survey shall be conducted for existing structures in order to document existing structural conditions. Any structural damage resulting from nearby impact pile-driving activities shall be repaired in a timely manner by the developer. The building conditions survey shall be conducted by a licensed professional engineer and shall include pre- and post-construction surveys. The surveys shall, at a minimum, include the following:

a. Photographic and videotape documentation of the interior and exterior condition of the building(s);

b. The extent and location of existing signs of building distress such as cracks, spalling, signs of settlement, flooding, leaking, etc.

Timing/Implementation: *As a Condition of Approval for any building or construction permit for the parking garages.*

Enforcement/Monitoring: *City of Pittsburg Development Services Department*

Mitigation measure **MM 4.5.1** would ensure that construction-related activities, including the use of pile drivers, would be limited to the less noise-sensitive daytime hours. In the event that pile driving is required for the construction of the proposed parking garages, the use of impact pile drivers within 160 feet of nearby structures would be substituted with equipment or procedures that would generate lower levels of groundborne vibration, to the extent that geologic conditions would permit their use. With the use of alternative pile-driving techniques, such as sonic or drilled piles, predicted groundborne vibration levels at the nearest commercial structures located within the Oak Hills Shopping Center would be reduced to approximately 0.4 in/sec ppv, or less. Implementation of the proposed mitigation measures would reduce this impact. However, depending on the construction techniques used, construction of proposed Parking Garage 1 could still result in activity interference and annoyance to occupants of the nearby commercial uses. For this reason, this impact would be considered **significant and unavoidable**. However, it is important to note that this conclusion may change in the future, as specific development proposals are received by the City that include more detailed construction information and equipment requirements.

4.5.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The geographic extent of the cumulative setting for noise consists of the Master Plan area and the surrounding areas within the City of Pittsburg and Contra Costa County. Cumulative development conditions would result in increased cumulative roadway noise levels and would also result in increased noise associated with future development. As noted earlier, ambient noise levels in the Master Plan area are influenced primarily by traffic noise emanating from area roadways, particularly State Route 4 and West Leland Road. No major stationary sources of noise have been identified in the Master Plan area. Therefore, the primary factor for cumulative noise impact analysis is the consideration of future traffic noise levels.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Contribution to Cumulative Noise Levels

Impact 4.5.6 Implementation of the proposed project would not result in a substantial contribution to cumulative noise levels. The impact would be considered **less than cumulatively considerable.**

The proposed project's contribution to the cumulative traffic noise levels along area roadways was determined by comparing the predicted noise levels with and without project-generated traffic. Predicted increases in future cumulative traffic noise levels along primarily affected roadways are depicted in **Table 4.5-11**. Predicted distances to future cumulative traffic noise contours are identified in **Table 4.5-9** (refer to Impact 4.5.4).

TABLE 4.5-11
PREDICTED INCREASES IN TRAFFIC NOISE LEVELS CUMULATIVE CONDITIONS

Roadway	CNEL/Ldn at 50 Feet from Near-Travel-Lane Centerline[1]		Predicted Increase	Substantial Increase?[2]
	Without Project	With Project		
Bailey Road, North of West Leland Road	65.64	66.27	0.63	*No*
Bailey Road, South of West Leland Road	63.02	63.44	0.42	*No*
West Leland Road, East of Bailey Road	67.24	67.37	0.13	*No*
West Leland Road, Bailey Road to Oak Hills Drive	66.55	67.32	0.77	*No*

Roadway	CNEL/Ldn at 50 Feet from Near-Travel-Lane Centerline[1]		Predicted Increase	Substantial Increase?[2]
	Without Project	With Project		
West Leland Road, Oak Hills Drive to East BART Driveway	66.33	66.87	0.54	*No*
West Leland Road, East BART Driveway to West BART Driveway	66.25	66.36	0.11	*No*
West Leland Road, West BART Driveway to Woodhill Drive	65.69	66.15	0.46	*No*
West Leland Road, Woodhill Drive to Alves Ranch Drive	68.87	69.30	0.43	*No*

Notes: 1. Traffic noise levels were calculated using the FHWA roadway noise prediction model.
2. Substantial increases defined as an increase of 5.0 dBA, or greater, where noise levels are less than 60 dBA CNEL; 3.0 dBA, or greater, where noise levels range from 60 to 65 dBA CNEL; and 1.5 dB, or greater, where the noise level exceeds 65 dBA CNEL without the proposed project.

As depicted in **Table 4.5-11**, implementation of the proposed Master Plan would result in predicted increases of 0.11 to 0.77 dB. The proposed project would not result in a substantial increase in traffic noise levels along primarily affected area roadways. It is important to note that the traffic noise levels presented in **Table 4.5-9** and **Table 4.5-11** do not take into account noise reductions provided by existing structures, barriers, or terrain. Residential land uses located along the adjacent segments of West Leland Road are currently shielded from direct line of sight of area roadways by existing sound barriers or are set back at sufficient distance to minimize the effects of traffic noise. In these locations, predicted traffic noise levels would be less than the levels identified in **Table 4.5-9** and **Table 4.5-11**. Given that the proposed project would not result in a significant contribution to traffic noise levels, and given that predicted future cumulative traffic noise levels along area roadways would not be predicted to exceed the City's conditionally acceptable noise level of 70 dBA CNEL/L_{dn}, the proposed project's cumulative contribution to ambient noise levels would be considered **less than cumulatively considerable**.

Mitigation Measures

None required.

REFERENCES

AMBIENT Air Quality & Noise Consulting. 2011. Noise & Groundborne Vibration Impact Assessment for the Proposed Pittsburg/Bay Point BART Station Master Plan.

Bay Area Rapid Transit (BART). Schedules by Station. http://www.bart.gov/schedules (accessed February 18, 2011).

California Department of Transportation (Caltrans). 2002. *Transportation Related Earthborne Vibrations*.

———. 2004. *Transportation- and Construction-Induced Vibration Guidance Manual.*

———. 2011. IS/EA Annotated Outline. http://www.dot.ca.gov/ser/vol1/sec4/ch31ea/chap31ea.htm (accessed February 8, 2011).

City of Pittsburg. 2004. City of Pittsburg 2020 General Plan, Noise Element. http://www.ci.pittsburg.ca.us/Pittsburg/Government/Departments/Planning-Building/gen-plan.htm

———. 2009 Pittsburg Municipal Code. http://www.codepublishing.com/ca/pittsburg/ (accessed September 2009).

Federal Interagency Committee on Noise (FICON). 2000. Discussion of Methodologies of Measuring Noise Impact.

Federal Transit Administration (FTA). 2006. Transit Noise and Vibration Impact Assessment.

State of California Office of Planning and Research. 2003. General Plan Guidelines.

Transit Unlimited. 2011. Pittsburg/Bay Point Station – Transit Schedules. http://www.transitunlimited.org/Pittsburg/Bay-Point_Station (accessed February 19, 2011)

United States Department of Transportation, Federal Transit Administration (FTA). 2006. Transit Noise and Vibration Impact Assessment.

United States Environmental Protection Agency (EPA). 1971. Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances.

4.6 AIR QUALITY

This section examines the air quality in the region of the proposed Master Plan, including a summary of applicable air quality regulations and potential air quality impacts associated with the proposed Master Plan. The reader is also referred to Section 4.11, Public Services and Utilities, for additional discussion regarding electrical and natural gas service and Section 4.13, Climate Change and Greenhouse Gases, for a discussion on climate change and associated environmental effects.

4.6.1 EXISTING SETTING

The proposed Master Plan is located in the City of Pittsburg in eastern Contra Costa County, within the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). BAAQMD is the regional air quality agency for the San Francisco Bay Area Air Basin (SFBAAB), which comprises all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties, the southern portion of Sonoma County, and the southwestern portion of Solano County. The SFBAAB is depicted in **Figure 4.6-1**. Air quality in this area is determined by such natural factors as topography, meteorology, and climate, in addition to the presence of existing air pollution sources and ambient conditions.

REGIONAL CLIMATE, TOPOGRAPHY, AIR POLLUTION POTENTIAL

The SFBAAB is characterized by complex terrain, consisting of coastal mountain ranges, inland valleys, and bays, which distort normal wind flow patterns. The Coast Range splits, resulting in a western coast gap and an eastern coast gap that allow air to flow in and out of the SFBAAB and the Central Valley.

High Pressure Cell

During the summer, the large-scale meteorological condition that dominates the West Coast is a semi-permanent high pressure cell centered over the northeastern Pacific Ocean. This high pressure cell typically keeps storms from affecting the California coast. Hence, the SFBAAB experiences little precipitation in the summer months. Winds tend to blow onshore from the north/northwest during this time.

The steady northwesterly flow induces upwelling of cold water from below. This upwelling produces a band of cold water off the California coast. When air approaches the California coast, already cool and moisture-laden from its long journey over the Pacific, it is further cooled as it crosses this bank of cold water. This cooling often produces condensation, resulting in a high incidence of fog and stratus clouds along the Northern California coast in the summer.

Generally in the winter, the Pacific high weakens and shifts southward, winds tend to flow offshore, upwelling ceases, and storms occur. During the winter rainy periods, inversions (layers of warmer air over colder air; see below) are weak or nonexistent, winds are usually moderate, and air pollution potential is low. The Pacific high does periodically become dominant, bringing strong inversions, light winds, and high pollution potential.

Topography

The complex terrain of the SFBAAB, particularly in the higher elevations, distorts the normal wind flow patterns in the SFBAAB. The greatest distortion occurs when low-level inversions are present and the air beneath the inversion flows independently of air above the inversion, a condition that is common in the summertime (BAAQMD 2010a).

The only major break in California's Coast Range occurs in the SFBAAB. Here the Coast Range splits into western and eastern ranges. Between the two ranges lies San Francisco Bay. The gap in the western coast range is known as the Golden Gate, and the gap in the eastern coast range is the Carquinez Strait. These gaps allow air to pass into and out of the SFBAAB and the Central Valley (BAAQMD 2010a).

Wind Patterns

During the summer, winds flowing from the northwest are drawn inland through the Golden Gate and over the lower portions of the San Francisco Peninsula. Immediately south of Mount Tamalpais, the northwesterly winds accelerate considerably and come more directly from the west as they stream through the Golden Gate. This channeling of wind through the Golden Gate produces a jet that sweeps eastward and splits off to the northwest toward Richmond and to the southwest toward San Jose when it meets the East Bay hills (BAAQMD 2010a).

Wind speeds may be strong locally in areas where air is channeled through a narrow opening, such as the Carquinez Strait, the Golden Gate, or the San Bruno gap. For example, the average wind speed at San Francisco International Airport in July is about 17 knots (from 3 PM to 4 PM), compared with only 7 knots at San Jose and less than 6 knots at the Farallon Islands. The air flowing in from the coast to the Central Valley, called the sea breeze, begins developing at or near ground level along the coast in late morning or early afternoon. As the day progresses, the sea breeze layer deepens and increases in velocity while spreading inland. The depth of the sea breeze depends in large part upon the height and strength of the inversion. If the inversion is low and strong, and hence stable, the flow of the sea breeze will be inhibited and stagnant conditions are likely to result (BAAQMD 2010a).

In the winter, the SFBAAB frequently experiences stormy conditions with moderate to strong winds, as well as periods of stagnation with very light winds. Winter stagnation episodes are characterized by nighttime drainage flows in coastal valleys. Drainage is a reversal of the usual daytime air flow patterns; air moves from the Central Valley toward the coast and back down toward the Bay from the smaller valleys within the SFBAAB (BAAQMD 2010a).

Temperature

Summertime temperatures in the SFBAAB are determined in large part by the effect of differential heating between land and water surfaces. Because land tends to heat up and cool off more quickly than water, a large-scale gradient (differential) in temperature is often created between the coast and the Central Valley, and small-scale local gradients are often produced along the shorelines of the ocean and bays. The temperature gradient near the ocean is also exaggerated, especially in summer, because of the upwelling of cold ocean bottom water along the coast. On summer afternoons the temperatures at the coast can be 35°F cooler than temperatures 15 to 20 miles inland. At night this contrast usually decreases to less than 10°F (BAAQMD 2010a).

In the winter, the relationship of minimum and maximum temperatures is reversed. During the daytime the temperature contrast between the coast and inland areas is small, whereas at night the variation in temperature is large (BAAQMD 2010a).

Source: BAAQMD 2010(a)

Figure 4.6-1

San Francisco Bay Area Air Basins

PMC®

Precipitation

The SFBAAB is characterized by moderately wet winters and dry summers. Winter rains account for about 75 percent of the average annual rainfall. The amount of annual precipitation can vary greatly from one part of the SFBAAB to another even within short distances. In general, total annual rainfall can reach 40 inches in the mountains, but it is often less than 16 inches in sheltered valleys (BAAQMD 2010a).

During rainy periods, ventilation (rapid horizontal movement of air and injection of cleaner air) and vertical mixing are usually high, and thus pollution levels tend to be low. However, frequent dry periods occur during the winter where mixing and ventilation are low and pollutant levels build up (BAAQMD 2010a).

Air Pollution Potential

The potential for high pollutant concentrations developing at a given location depends on the quantity of pollutants emitted into the atmosphere in the surrounding area or upwind and the ability of the atmosphere to disperse the contaminated air. The topographic and climatological factors discussed above influence the atmospheric pollution potential of an area. Atmospheric pollution potential, as the term is used here, is independent of the location of emission sources and is instead a function of factors described below.

Wind Circulation

Low wind speed contributes to the buildup of air pollution because it allows more pollutants to be emitted into the air mass per unit of time. Light winds occur most frequently during periods of low sun (fall and winter, and early morning) and at night. These are also periods when air pollutant emissions from some sources are at their peak, namely, commute traffic (early morning) and wood-burning appliances (nighttime). The problem can be compounded in valleys, when weak flows carry the pollutants upvalley during the day and cold air drainage flows move the air mass downvalley at night. Such restricted movement of trapped air provides little opportunity for ventilation and leads to buildup of pollutants to potentially unhealthful levels (BAAQMD 2010a).

Solar Radiation

The frequency of hot, sunny days during the summer months in the SFBAAB is another important factor that affects air pollution potential. It is at the higher temperatures that ozone is formed. In the presence of ultraviolet sunlight and warm temperatures, reactive organic gases and oxides of nitrogen react to form secondary photochemical pollutants, including ozone. Because temperatures in many of the SFBAAB inland valleys are so much higher than near the coast, the inland areas are especially prone to photochemical air pollution. In late fall and winter, solar angles are low, resulting in insufficient ultraviolet light and warming of the atmosphere to drive the photochemical reactions. Ozone concentrations do not reach significant levels in the SFBAAB during these seasons (BAAQMD 2010a).

Inversions

An inversion is a layer of warmer air over a layer of cooler air. Inversions affect air quality conditions significantly because they influence the mixing depth, i.e., the vertical depth in the atmosphere available for diluting air contaminants near the ground. The highest air pollutant concentrations in the SFBAAB generally occur during inversions (BAAQMD 2010a).

There are two types of inversions that occur regularly in the SFBAAB. One is more common in the summer and fall, while the other is most common during the winter. The frequent occurrence of elevated temperature inversions in summer and fall months acts to cap the mixing depth, limiting the depth of air available for dilution (BAAQMD 2010a).

The inversions typical of winter, called radiation inversions, are formed as heat quickly radiates from the earth's surface after sunset, causing the air in contact with it to rapidly cool. Radiation inversions are strongest on clear, low-wind, cold winter nights, allowing the buildup of such pollutants as carbon monoxide and particulate matter. When wind speeds are low, there is little mechanical turbulence to mix the air, resulting in a layer of warm air over a layer of cooler air next to the ground. Mixing depths under these conditions can be as shallow as 50 to 100 meters (164 to 328 feet), particularly in rural areas. Urban areas usually have deeper minimum mixing layers because of heat island effects and increased surface roughness. During radiation inversions downwind transport is slow, the mixing depths are shallow, and turbulence is minimal (BAAQMD 2010a).

Although each type of inversion is most common during a specific season, either inversion mechanism can occur at any time of the year. Sometimes both occur simultaneously. Moreover, the characteristics of an inversion often change throughout the course of a day. The terrain of the SFBAAB also induces significant variations among subregions (BAAQMD 2010a).

LOCAL ATMOSPHERIC CONDITIONS

Although air pollution potential is strongly influenced by climate and topography, the air pollution that occurs in a location also depends on the amount of air pollutant emissions in the surrounding area or transported from more distant places. Air pollutant emissions generally are highest in areas that have high population densities, high motor vehicle use, and/or industrialization. The contaminants created by photochemical processes in the atmosphere, such as ozone, may result in high concentrations many miles downwind from the sources of their precursor pollutants (BAAQMD 2010a).

Varying climatological and topographic conditions, the location of emission sources, and susceptibility to emissions transport can combine to result in substantial variations in air pollution potential within inhabited subregions of the SFBAAB (BAAQMD 2010a).

Carquinez Strait Subregion

Within the SFBAAB, there are eleven major climatological subregions (BAAQMD 2010a). The City of Pittsburg, and thus the proposed Master Plan area, is located within the Carquinez Strait Subregion. It is the only sea-level gap between the Bay and the Central Valley. The Carquinez Strait Subregion includes the lowlands bordering the strait to the north and south, and includes the area adjoining the Suisun Bay and the western part of the Sacramento-San Joaquin Delta as far east as Bethel Island. The subregion extends from Rodeo in the southwest and Vallejo in the northwest to Fairfield on the northeast and Brentwood on the southeast.

Prevailing winds are from the west in the Carquinez Strait. During the summer and fall months, high pressure offshore coupled with low pressure in the Central Valley causes marine air to flow eastward through the Carquinez Strait. The wind is strongest in the afternoon. Afternoon wind speeds of 15 to 20 miles per hour (mph) are common throughout the strait region. Annual average wind speeds are 8 mph in Martinez and 9 to 10 mph farther east. Sometimes atmospheric conditions cause air to flow from the east. East winds usually contain more pollutants than the cleaner marine air from the west. In the summer and fall months, this can cause elevated pollutant levels to move into the central SFBAAB through the strait. These high pressure periods are usually accompanied by low wind speeds, shallow mixing depths, higher temperatures, and little or no rainfall.

Summer mean maximum temperatures reach about 90° Fahrenheit in the subregion. Mean minimum temperatures in the winter are in the high 30s. Temperature extremes are especially pronounced in sheltered areas farther from the moderating effects of the strait itself. Many industrial facilities with significant air pollutant emissions — e.g., chemical plants and refineries — are located within the Carquinez Strait Subregion. The pollution potential of this area is often moderated by high wind speeds. However, upsets at industrial facilities can lead to short-term pollution episodes, and emissions of unpleasant odors may occur at any time. Receptors downwind of these facilities could suffer more long-term exposure to air contaminants than individuals elsewhere. Areas of the subregion that are traversed by major roadways such as Interstate 80 may also be subject to higher local concentrations of carbon monoxide and particulate matter, as well as certain toxic air contaminants such as benzene (BAAQMD 2010a).

AMBIENT AIR QUALITY STANDARDS

Both the U.S. Environmental Protection Agency (EPA) and California Air Resources Board (CARB) established ambient air quality standards for common air pollutants. These ambient air quality standards are levels of contaminants that represent safe levels intended to avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called "criteria" pollutants because the health and other effects of each pollutant are described in criteria documents. The federal and state ambient standards were developed independently with differing purposes and methods, although both processes attempted to avoid health-related effects. As a result, federal and state standards differ in some cases. In general, California standards are more stringent. This is particularly true for nitrogen dioxide (NO_2) and coarse particulate matter (PM_{10}). The federal and California state ambient air quality standards and BAAQMD attainment status are summarized in **Table 4.6-1**.

CURRENT AMBIENT AIR QUALITY

BAAQMD operates a regional air quality monitoring network that regularly measures the concentrations of the five major criteria air pollutants. Air quality conditions in the SFBAAB have improved significantly since BAAQMD was created in 1955. Ambient concentrations and the number of days on which the region exceeds standards have declined dramatically. Neither state nor national ambient air quality standards have been violated in recent decades for nitrogen dioxide, sulfur dioxide, sulfates, lead, hydrogen sulfide, and vinyl chloride.

TABLE 4.6-1
FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS AND ATTAINMENT STATUS

Pollutant	Averaging Time	State Standard	Attainment Status	Federal Primary Standard	Attainment Status
Ozone (O_3)	1-Hour 8-Hour	0.09 ppm 0.07 ppm	N --	-- 0.075 ppm	-- N
Carbon Monoxide (CO)	1-Hour 8-Hour	20 ppm 9.0 ppm	A	35 ppm 9.0 ppm	U/A
Nitrogen Dioxide (NO_2)	Annual Average 1-Hour	0.03 ppm 0.18 ppm	-- A	0.053 ppm 0.1 ppm	U/A --
Sulfur Dioxide (SO_2)	24-Hour 3-Hour 1-Hour	0.04 ppm — 0.25 ppm	A — A	-- -- 0.075 ppm	A A --
Respirable Particulate Matter (PM_{10})	Annual Average 24-Hour	20 $\mu g/m^3$ 50 $\mu g/m^3$	N	— 150 $\mu g/m^3$	U
Fine Particulate Matter ($PM_{2.5}$)	Annual Average 24-Hour	12 $\mu g/m^3$ —	N --	15 $\mu g/m^3$ 35 $\mu g/m^3$	N
Lead	30-day Average Calendar Quarter	1.5 $\mu g/m^3$ --	A --	-- 1.5 $\mu g/m^3$	-- --
Sulfates	24-Hour	25 $\mu g/m^3$	A	No National Standards	
Hydrogen Sulfide	1-hour	0.03 ppm	U		
Vinyl Chloride	24-hour	0.01 ppm	--		
Visibility Reducing Particulate Matter	8-hour	Extinction coefficient of 0.23 per kilometer-visibility of 10 miles or more	U		

Source: CARB 2010a; BAAQMD 2010a
Notes: ppm = parts per million, μg/m3 = micrograms per cubic meter. N = Nonattainment; A = Attainment; U = Unclassified

The nearest ambient air quality monitoring station to the proposed Master Plan area is the Pittsburg-10th Street monitoring station, located to the northeast of the Master Plan area. **Table 4.6-2** summarizes historical occurrences of pollutant levels for this monitoring station, based on the last three years of available data (i.e., 2007–2009). The number of days for which state and federal ambient air quality standards have been exceeded during this same monitoring period is also presented. As depicted, there have been no days during which measured concentrations of carbon monoxide or nitrogen dioxide exceeded federal or state ambient air quality standards during the last three years of available data. The state standard for PM_{10} was exceeded on over 24 days in 2007 and has not been exceeded since, and the state standard for ozone was exceeded twice in both 2007 and 2008.

TABLE 4.6-2
AMBIENT AIR QUALITY MONITORING DATA

Pollutant Standards	2007	2008	2009
Ozone			
Max 1-hour concentration (ppm)	0.100	0.106	--
Max 8-hour concentration (ppm) (state/federal)	0.075/0.074	0.083/0.083	--/--
Number of days above state 1-hr standard	1	1	--
Number of days above state/federal 8-hour standard	2/0	2/1	--/--
Respirable Particulate Matter (PM_{10})			
Max 24-hour concentration (μg/m3) (state/federal)	59/55.6	72.7/73.6	--/--
Number of days above state/federal standard	24.2/0	--/--	--/--
Carbon Monoxide (CO)			
Max 1-hr/8-hr concentration (ppm)	--/1.5	--/1.44	--/--
Number of days above state/federal 8-hour standards	0	0	0
Number of days above state/federal 1-hour standard	0	0	0
Nitrogen Dioxide (NO_2)			
Max 1-Hour concentration (ppm)	0.051	0.056	--
Annual concentration (ppm)	0.010	0.010	--
Number of days above state standard	0	0	0

Source: CARB 2010b; EPA 2010
Based on ambient monitoring data obtained from the Pittsburg-10th Street monitoring station.
-- Insufficient or no data currently available to determine the value.

AIR POLLUTANTS OF CONCERN AND HEALTH EFFECTS

The most problematic pollutants in the region include ozone and particulate matter. The health effects and major sources of these pollutants are described below. Toxic air contaminants are a separate class of pollutants and are discussed later in this section.

Ozone

Ground-level ozone (O_3), commonly referred to as smog, is greatest on warm, windless, sunny days. Ozone is not emitted directly into the environment, but is formed in the atmosphere by complex chemical reactions between reactive organic gases (ROG) and nitrogen oxide (NO_X) in the presence of sunlight. The main sources of NO_X and ROG, often referred to as ozone precursors, are combustion processes (including motor vehicle engines) the evaporation of solvents, paints, and fuels, and biogenic sources. Automobiles are the single largest source of ozone precursors in the SFBAAB. Tailpipe emissions of ROG are highest during cold starts, hard acceleration, stop-and-go conditions, and slow speeds. They decline as speeds increase up to about 50 mph, then increase again at high speeds and high engine loads. ROG emissions associated with evaporation of unburned fuel depend on vehicle and ambient temperature cycles. Nitrogen oxide emissions exhibit a different curve; emissions decrease as the vehicle approaches 30 mph and then begin to increase with increasing speeds (BAAQMD 2010a).

Ozone levels usually build up during the day and peak in the afternoon hours. Short-term exposure can irritate the eyes and cause constriction of the airways. Besides causing shortness of breath, ozone can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema. Chronic exposure to high ozone levels can permanently damage lung tissue. Ozone can also damage plants and trees, as well as materials such as rubber and fabrics (BAAQMD 2010a).

Particulate Matter

Particulate matter (PM) can be divided into several size fractions. Coarse particles (PM_{10}) are between 2.5 and 10 microns in diameter and arise primarily from natural processes, such as wind-blown dust or soil. Fine particles ($PM_{2.5}$) are less than 2.5 microns in diameter and are produced mostly from combustion or burning activities. Fuel burned in cars and trucks, power plants, factories, fireplaces, and wood stoves produces fine particles.

The level of $PM_{2.5}$ in the air is a public health concern because it can bypass the body's natural filtration system more easily than larger particles and can lodge deep in the lungs. The health effects vary depending on a variety of factors, including the type and size of particles. Research has demonstrated a correlation between high PM concentrations and increased mortality rates. Elevated PM concentrations can also aggravate chronic respiratory illnesses such as bronchitis and asthma (BAAQMD 2010a).

Carbon Monoxide

Carbon monoxide (CO) is an odorless, colorless gas that is formed by the incomplete combustion of fuels. At high concentrations, CO reduces the oxygen-carrying capacity of the blood and can cause dizziness, headaches, unconsciousness, and even death. CO can also aggravate cardiovascular disease. Relatively low concentrations of CO can significantly affect the amount of oxygen in the bloodstream because CO binds to hemoglobin more strongly than oxygen.

Elevated CO concentrations are usually localized and are often the result of a combination of high traffic volumes and traffic congestion. Elevated CO levels develop primarily during winter periods of light winds or calm conditions combined with the formation of ground-level temperature inversions. Wintertime CO concentrations are higher because of reduced dispersion of vehicle emissions and because CO emission rates from motor vehicles increase as temperature decreases. However, CO emissions and ambient concentrations have decreased significantly in recent years. These improvements are due largely to the introduction of cleaner-burning motor vehicles and motor vehicle fuels. CO is still a pollutant that must be closely monitored, however, due to its severe effect on human health.

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is a brownish, highly reactive gas that is present in all urban environments. The major human-made sources of NO_2 are combustion devices such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Construction devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2. The combined emissions of NO and NO_2 are referred to as NO_X. Because NO_2 is formed and depleted by reactions associated with ozone, the NO_2 concentration in a particular geographic area may not be representative of the local NO_X emission sources.

Inhalation is the most common route of exposure to NO_2. Because NO_2 has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of adverse health effects depends primarily on the concentration inhaled rather than the duration of the exposure. Exposure can result in a variety of acute symptoms, including coughing, difficulty with breathing, vomiting, headache, and eye irritation. Symptoms that are more significant may include chemical pneumonitis or pulmonary edema with breathing abnormalities, cyanosis, chest pain, and rapid heartbeat.

Sulfur Dioxide

Sulfur dioxide (SO_2) is produced by such stationary sources as coal and oil combustion, steel mills, refineries, and pulp and paper mills. The major adverse health effects associated with exposure to SO_2 pertain to the upper respiratory tract. SO_2 is a respiratory irritant with constriction of the bronchioles occurring with inhalation of SO_2 at 5 parts per million (ppm) or more. On contact with the moist mucous membranes, SO_2 produces sulfurous acid, which is a direct irritant. Similar to NO_2, the severity of adverse health effects depends primarily on the concentration inhaled rather than the duration of the exposure. Exposure to high concentrations of SO_2 may result in edema of the lungs or glottis and respiratory paralysis.

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern. TACs are considered either carcinogenic or noncarcinogenic based on the nature of the health effects associated with exposure to the pollutant. For regulatory purposes, carcinogenic TACs are assumed to have no safe threshold below which health impacts would not occur and cancer risk is expressed as excess cancer cases per one million exposed individuals. Noncarcinogenic TACs differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis.

There are many different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Public exposure to TACs can result from emissions from normal operations, as well as from accidental releases of hazardous materials during upset conditions. The health effects of TACs include cancer, birth defects, neurological damage, and death. **Table 4.6-3** displays potential sources of TAC emissions for various land uses.

TABLE 4.6-3
TOXIC AIR EMISSION BY LAND USE

Land Use	Toxic Air Emission
Auto Body Shop	Benzene, Toluene, Xylene
Auto Machine Shop	Asbestos
Chemical Manufacturing	Ethylene, Dichloride, Asbestos
Dry Cleaner	Perchloroethylene (phased out in 2011)
Electrical Manufacturing	Polychlorinated Biphenyls (PCBs), Cadmium, Chromium, Nickel
Funeral Home	Formaldehyde
Gasoline Station	Benzene
Hospital	Dioxin, Cadmium, Ethylene Oxide
Medical Equipment Sterilization	Ethylene Oxide
Printing Services	Ethyl Benzene, Ethylene Glycol, Xylene
Wastewater Treatment	Benzene, Carbon Tetrachloride, Ethylene Dichloride, Chloroform

Source: EDCAPCD 2002

Diesel Exhaust

Diesel exhaust is a TAC of growing concern in California. According to the *California Almanac of Emissions and Air Quality* (CARB 2009), the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being PM from diesel-fueled engines (diesel particulate matter, or DPM). In 1998, CARB identified DPM as a toxic air contaminant. DPM differs from other TACs in that it is not a single substance but rather a complex mixture of hundreds of substances. The exhaust from diesel engines contains hundreds of different gaseous and particulate components, many of which are toxic. Many of these compounds adhere to the particles, and because diesel particles are so small, they penetrate deep into the lungs. DPM has been identified as a human carcinogen. Mobile sources, such as trucks, buses, automobiles, trains, ships, and farm equipment, are by far the largest source of diesel emissions. Studies show that diesel particulate matter concentrations are much higher near heavily traveled highways and intersections. BAAQMD research indicates that mobile-source emissions of DPM represent a substantial portion of the ambient background risk from TACs in the SFBAAB (BAAQMD 2010a).

Unlike criteria pollutants, there are no ambient air quality standards for TACs because no safe levels of TACs can be determined. Instead, TAC impacts are evaluated by calculating the health risks associated with a given exposure. Two types of risk are usually assessed: chronic non-cancer risk and acute non-cancer risk. Both the State of California and BAAQMD implement programs of identifying and reducing DPM health risks. These programs include implementation and enforcement of new regulatory standards for all new on-road, off-road, and stationary diesel-fueled engines and vehicles, new retrofit requirements for existing on-road, off-road, and stationary diesel-fueled engines and vehicles, and new diesel fuel regulations to reduce the sulfur content of diesel fuel as required by advanced diesel emission control systems. Land uses where individuals could be exposed to high levels of diesel exhaust include:

- Railroad operations
- Warehouses

- Schools with a high volume of bus traffic
- High volume highways (such as Interstate 80)
- High volume arterials and local roadways with a high level of diesel traffic

Land Use Compatibility with TAC Emission Sources

CARB published an informational guide entitled *Air Quality and Land Use Handbook: A Community Health Perspective* in 2005. The purpose of this guide is to provide information to aid local jurisdictions in addressing issues and concerns related to the placement of sensitive land uses near major sources of air pollution. The CARB handbook includes recommended separation distances for various land uses that are based on relatively conservative estimations of emissions based on source-specific information. However, these recommendations are not site-specific and should not be interpreted as defined "buffer zones." For informational purposes, it should be noted that the recommendations of the handbook are advisory and need to be balanced with other state and local policies (CARB 2005). Depending on site- and project-specific conditions, an assessment of potential increases in exposure to TACs may be warranted for proposed development projects located within the distances identified. CARB-recommended separation distances for various sources of emissions are summarized in **Table 4.6-4**.

TABLE 4.6-4
RECOMMENDATIONS ON SITING NEW SENSITIVE LAND USES NEAR AIR POLLUTANT SOURCES

Source Category	Advisory Recommendations
Freeways and High-Traffic Roads	Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles per day, or rural roads with 50,000 vehicles per day.
Distribution Centers	Avoid siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units (TRUs) per day, or where TRU unit operations exceed 300 hours per week).
	Take into account the configuration of existing distribution centers and avoid locating residences and other new sensitive land uses near entry and exit points.
Rail Yards	Avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard.
	Within one mile of a rail yard, consider possible siting limitations and mitigation approaches.
Ports	Avoid siting of new sensitive land uses immediately downwind of ports in the most heavily impacted zones. Consult local air districts or CARB on the status of pending analyses of health risks.
Refineries	Avoid siting new sensitive land uses immediately downwind of petroleum refineries. Consult with local air districts and other local agencies to determine an appropriate separation.
Chrome Platers	Avoid siting new sensitive land uses within 1,000 feet of a chrome plater.
Dry Cleaners Using Perchloroethylene	Avoid siting new sensitive land uses within 300 feet of any dry cleaning operation. For operations with two or more machines, provide 500 feet. For operations with 3 or more machines, consult with the local air district.
	Do not site new sensitive land uses in the same building with perchloroethylene dry cleaning operations.

Source Category	Advisory Recommendations
Gasoline Dispensing Facilities	Avoid siting new sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50-foot separation is recommended for typical gas dispensing facilities.

Source: CARB 2005
Note: Recommendations are advisory, are not site-specific, and may not fully account for future reductions in emissions, including those resulting from compliance with existing/future regulatory requirements, such as reductions in diesel-exhaust emissions anticipated to occur with continued implementation of CARB's Diesel Risk Reduction Plan.

Wood Smoke

Wood smoke has long been identified as a significant source of pollutants in urban and suburban areas. Wood smoke contributes to particulate matter and CO concentrations, reduces visibility, and contains numerous TACs. Present controls on this source include the adoption of emission standards for wood stoves and fireplace inserts. In 2008, BAAQMD adopted Regulation 6, Rule 3 (Wood-Burning Devices) to reduce harmful emissions associated with wood smoke (BAAQMD 2010a).

Asbestos

Asbestos is the common name for a group of naturally occurring fibrous silicate minerals that can separate into thin but strong and durable fibers. Naturally occurring asbestos, which was identified as a TAC in 1986 by CARB, is located in many parts of California and is commonly associated with ultramafic rock. The Master Plan area is not located near any areas that are likely to contain ultramafic rock.

Odors

Typically odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another. It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

There are no reported sources of odors in the vicinity of the Master Plan Area. Nor are any typical land uses known to emit strong odors, such as a rendering plant, incinerator, or industrial plant located within the vicinity.

4.6.2 REGULATORY FRAMEWORK

Air quality in the SFBAAB is addressed through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy making, education, and a variety of programs. The agencies primarily responsible for improving the air quality in the SFBAAB, including the City of Pittsburg, are discussed below, along with their individual responsibilities.

FEDERAL

U.S. Environmental Protection Agency

The EPA is responsible for enforcing the federal Clean Air Act (CAA) and the 1990 amendments to it (CAAA), and the national ambient air quality standards (federal standards) that the EPA establishes. These standards identify levels of air quality for six criteria pollutants, which are considered the maximum levels of ambient (background) air pollutants considered safe, with an adequate margin of safety, to protect public health and welfare. The six criteria pollutants include O_3, CO, NO_2, SO_2, PM_{10}, and lead. The EPA also has regulatory and enforcement jurisdiction over emission sources beyond state waters (outer continental shelf) and sources that are under the exclusive authority of the federal government, such as aircraft, locomotives, and interstate trucking.

As part of its enforcement responsibilities, the EPA requires each state with nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the federal standards. The SIP must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution in nonattainment areas, using a combination of performance standards and market-based programs.

Hazardous Air Pollutant Program

Title III of the federal Clean Air Act Amendments (CAAA) requires the EPA to promulgate national emissions standards for hazardous air pollutants (NESHAPs). The NESHAP may differ for major sources than for area sources of hazardous air pollutants (HAPs). (Major sources are defined as stationary sources with potential to emit more than 10 tons per year (TPY) of any HAP or more than 25 TPY of any combination of HAPs; all other sources are considered area sources.) The emissions standards are to be promulgated in two phases. In the first phase (1992–2000), the EPA developed technology-based emission standards designed to produce the maximum emission reduction achievable. These standards are generally referred to as requiring maximum achievable control technologies (MACT). These federal rules are also commonly referred to as MACT standards, because they reflect the maximum achievable control technology. For area sources, the standards may be different, based on generally available control technology. In the second phase (2001–2008), the EPA was required to promulgate health risk-based emissions standards, where deemed necessary, to address risks remaining after implementation of the technology-based NESHAP standards. The CAAA required the EPA to promulgate vehicle or fuel standards containing reasonable requirements that control toxic emissions, at a minimum, to benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 required the use of reformulated gasoline in selected U.S. cities (those with the most severe ozone nonattainment conditions) to further reduce mobile-source emissions (BAAQMD 2010a).

STATE

California Air Resources Board

CARB, a department of the California Environmental Protection Agency, oversees air quality planning and control throughout California. It is primarily responsible for ensuring implementation of the 1989 amendments to the California Clean Air Act (CCAA), responding to the federal CAAA requirements, and for regulating emissions from motor vehicles and consumer products within the state. CARB has established emission standards for vehicles sold in California and for various types of equipment available commercially. It also sets fuel specifications to further reduce vehicular emissions.

The amendments to the CCAA establish ambient air quality standards for the state (state standards) and a legal mandate to achieve these standards by the earliest practical date. These standards apply to the same six criteria pollutants as the federal CAA and also include sulfate, visibility, hydrogen sulfide, and vinyl chloride. They are more stringent than the federal standards and, in the case of PM_{10} and NO_2, far more stringent.

Toxic Air Contaminant Programs

California regulates TACs primarily through the Tanner Air Toxics Act (Assembly Bill (AB) 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act sets forth a formal procedure for CARB to designate substances as TACs. This includes research, public participation, and scientific peer review before CARB can designate a substance as a TAC. To date, CARB has identified over 21 TACs and adopted the EPA's list of hazardous air pollutants (HAPs) as toxic air contaminants. Most recently, diesel exhaust particulate was added to the CARB list of TACs. Once a TAC is identified, CARB then adopts an Airborne Toxics Control Measure for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate toxic best available control technology to minimize emissions. None of the TACs identified by CARB have a safe threshold.

The Hot Spots Act requires that existing facilities that emit toxic substances above a specified level:

- Prepare a toxic emission inventory;
- Prepare a risk assessment if emissions are significant;
- Notify the public of significant risk levels;
- Prepare and implement risk reduction measures.

CARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses, and off-road diesel equipment (e.g., tractors, generators). In February 2000, CARB adopted a new public transit bus fleet rule and emission standards for new urban buses. These new rules and standards provide for

(1) more stringent emission standards for some new urban bus engines beginning with 2002 model year engines, (2) zero-emission bus demonstration and purchase requirements applicable to transit agencies, and (3) reporting requirements with which transit agencies must demonstrate compliance with the urban transit bus fleet rule. Milestones include the low sulfur diesel fuel requirement and tighter emission standards for heavy-duty diesel trucks (2007) and off-road diesel equipment (2011) nationwide. Over time, the replacement of older vehicles will result in a vehicle fleet that produces substantially less TACs than under current conditions.

Mobile-source emissions of TACs (e.g., benzene, 1-3-butadiene, diesel PM) have been reduced significantly over the last decade and will be reduced further in California through a progression of regulatory measures (e.g., Low Emission Vehicle/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies. With implementation of CARB's Risk Reduction Plan, it is expected that diesel PM concentrations will be reduced by 75 percent in 2010 and 85 percent in 2020 from the estimated year 2000 level. Adopted regulations are also expected to continue to reduce formaldehyde emissions from cars and light-duty trucks. As emissions are reduced, it is expected that risks associated with exposure to the emissions will also be reduced (BAAQMD 2010a).

Senate Bill 656

In 2003, the California Legislature enacted Senate Bill (SB) 656 to reduce public exposure to PM_{10} and $PM_{2.5}$. CARB approved a list of the most readily available, feasible, and cost-effective control measures that can be employed by air districts to reduce PM_{10} and $PM_{2.5}$ (collectively referred to as PM) in 2004. The list is based on rules, regulations, and programs existing in California as of January 1, 2004, for stationary, area-wide, and mobile sources. In 2005, air districts adopted implementation schedules for selected measures from the list. The implementation schedules identify the appropriate subset of measures and the dates for final adoption, implementation, and the sequencing of selected control measures. In developing the implementation schedules, each air district prioritized measures based on the nature and severity of the PM problem in their area and cost-effectiveness. Consideration was also given to ongoing programs such as measures being adopted to meet national air quality standards or the state ozone planning process.

LOCAL

Bay Area Air Quality Management District

BAAQMD attains and maintains air quality conditions in the San Francisco Bay Area Air Basin through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The BAAQMD clean air strategy includes the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution. BAAQMD also inspects stationary sources of air pollution and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by the CAA, CAAA, and CCAA. BAAQMD also limits emissions and public exposure to emissions, including TACs, through a number of programs. BAAQMD prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors. In addition, BAAQMD has adopted Regulation 11 Rules 2 and 14, which address asbestos demolition renovation, manufacturing, and standards for asbestos-containing serpentine (BAAQMD 2010a).

BAAQMD CEQA Guidelines

In June 2010, BAAQMD released the update to its California Environmental Quality Act (CEQA) Guidelines. This is an advisory document that provides the lead agency, consultants, and project applicants with uniform procedures for addressing air quality in environmental documents. The handbook contains the following applicable components (BAAQMD 2010a):

- Criteria and thresholds for determining whether a project may have a significant adverse air quality impact;
- Specific procedures and modeling protocols for quantifying and analyzing air quality impacts;
- Methods available to mitigate air quality impacts;
- Information for use in air quality assessments and environmental documents that will be updated more frequently such as air quality data, regulatory setting, climate, topography.

Bay Area 2010 Clean Air Plan

As stated above, BAAQMD prepares plans to attain ambient air quality standards in the SFBAAB. BAAQMD prepares ozone attainment plans for the national ozone standard and clean air plans for the California standard both in coordination with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG). With respect to applicable air quality plans, BAAQMD prepared the *Bay Area 2010 Clean Air Plan* (CAP) to address nonattainment of the national 1-hour ozone standard in the SFBAAB, as well as nonattainment of the California ambient air quality standards. The purpose of the 2010 Clean Air Plan is to (BAAQMD 2010a):

- Update the Bay Area 2005 Ozone Strategy in accordance with the requirements of the California Clean Air Act to implement “all feasible measures” to reduce ozone;
- Consider the impacts of ozone control measures on particulate matter (PM), air toxics, and greenhouse gases in a single, integrated plan;
- Review progress in improving air quality in recent years;
- Establish emission control measures to be adopted or implemented in the 2009–2012 time frame.

City of Pittsburg General Plan

Relevant City of Pittsburg General Plan policies related to air quality are provided below. **Table 4.6-5** discusses the project’s consistency with the City’s General Plan policies. While this Draft Environmental Impact Report (DEIR) analyzes the proposed project’s consistency with the General Plan pursuant to California Environmental Quality Act (CEQA) Guidelines Section 15125(d), the Pittsburg City Council ultimately determines consistency with the General Plan.

TABLE 4.6-5
PROJECT CONSISTENCY WITH GENERAL PLAN POLICIES

General Plan Policies	Consistency with General Plan	Analysis
Goal 9-G-9 – Work toward improving air quality and meeting all Federal and State ambient air quality standards by reducing the generation of air pollutants from stationary and mobile sources.	Yes	The proposed Master Plan includes dedicated pedestrian/bicycle pathways along the north side of West Leland Road, is located immediately adjacent to the Pittsburg/Bay Point BART station, and will include a large number of transit facilities (bus shelters, bus-only lanes, etc.). The internal circulation for both vehicles and pedestrians/bicyclists was designed in order to provide connectivity through the Master Plan area to the Pittsburg/Bay Point BART Station. As the proposed project constitutes transit-oriented development, and as such development has been found to reduce the overall number of vehicle trips, it is expected that the proposed project will have less air quality impacts than a comparable project without those features.
Goal 9-G-10 – Reduce the potential for human discomfort or illness due to local concentrations of toxic contaminants, odors and dust.	Yes	Mitigation measure MM 4.6.1 (see below) mandates the inclusion of BAAQMD-approved criteria air pollutant-reducing Basic Construction Mitigation Measures to all future construction within the Master Plan area where feasible whether or not construction-related emissions exceed applicable thresholds of significance. In addition, mitigation measures MM 4.6.5a through MM 4.6.5c require safety buffers that would protect existing residents during construction as well as future residents from air contaminates inherent to State Route (SR) 4 operations.
Goal 9-G-11 – Reduce the number of motor vehicle trips and emissions accounted to Pittsburg residents and encourage land use and transportation strategies that promote use of alternatives to the automobile for transportation, including bicycling, bus transit, and carpooling.	Yes	The land use designations of the Master Plan call for both street-level retail and flex uses, which will contain a mix of business commercial uses in conjunction with residential and quasi-business uses conducive to alternative modes of transportation. In addition, the Master Plan includes dedicated pedestrian/bicycle pathways along the north side of West Leland Road and is located immediately adjacent to the Pittsburg/Bay Point BART station and will include a large number of transit facilities (bus shelters, bus-only lanes, etc.). The internal circulation for both vehicles and pedestrians/bicyclists was designed in order to provide connectivity throughout the Master Plan area.
Policy 9-P-29 – Cooperate with the Bay Area Air Quality Management District to achieve emissions reductions for ozone and its precursor, PM-10.	Yes	The BAAQMD 2010 Clean Air Plan includes numerous control measures related to reducing emissions from stationary and mobile sources of emissions. As shown in **Table 4.6-7** below, the proposed Master Plan would be consistent with the control measures identified in the 2010 Clean Air Plan.

General Plan Policies	Consistency with General Plan	Analysis
Policy 9-P-30 – Cooperate with Bay Area Air Quality Management District to ensure compliance with dust abatement measures during construction.	Yes	Mitigation measure MM 4.6.1 mandates the inclusion of BAAQMD-approved criteria air pollutant-reducing Basic Construction Mitigation Measures for all future construction within the Master Plan area, whether or not construction-related emissions exceed applicable Thresholds of Significance. Many of the requirements of the these measures concern reducing dust during construction, including lower vehicle speeds, covered haul trucks, and watering of exposed surfaces.

4.6.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Per Appendix G of the California Environmental Quality Act (CEQA) Guidelines and BAAQMD recommendations, air quality impacts are considered significant if implementation of the proposed project would:

1) Conflict with or obstruct implementation of the applicable air quality plan.

2) Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

3) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

4) Expose sensitive receptors to substantial pollutant concentrations.

5) Create objectionable odors affecting a substantial number of people.

As stated in Appendix G, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations. To assist local jurisdictions in the evaluation of air quality impacts, BAAQMD has developed CEQA Guidelines, which were most recently updated in June 2010. BAAQMD CEQA Guidelines include recommended significance thresholds to be applied for project-level and program-level environmental documentation. In accordance with the BAAQMD CEQA Guidelines (2010), the following significance thresholds were relied upon for determination of impact significance associated with the proposed Master Plan (BAAQMD 2010a):

Criteria Air Pollutants and Precursors

To meet the project-level threshold of significance for construction-related criteria air pollutant and precursor impacts, construction of the proposed Master Plan must emit no more than 54 pounds per day (lbs/day) of ROG, NO_x, and/or $PM_{2.5}$ and no more than 82 lbs/day of PM_{10}.

To meet the project-level threshold of significance for operational-related criteria air pollutant and precursor impacts, the proposed Master Plan must satisfy the following criteria:

1) Consistency with current air quality plan (AQP) control measures.

2) Emit no more than 10 tons per year of ROG, NOx, and/or PM2.5 and no more than 15 tons per year of PM10.

Local Community Risk and Hazards

The plan-level BAAQMD-recommended thresholds of significance with regard to community risk and hazard impacts are as follows. Plan-level thresholds are considered appropriate for assessing community risks and hazards. However, due to the programmatic nature of the proposed Master Plan, specific commercial land uses (the potential source of TACs from the Master Plan) have not yet been identified and therefore explicit community risks and hazards cannot be known at the time of writing this DEIR.

1) The land use diagram must identify:

    a. Special overlay zones around existing and planned sources of TACs; and

    b. Special overlay zones of at least 500 feet (or Air District-approved modeled distance) on each side of all freeways and high-volume roadways; and

2) The Master Plan must also identify goals, policies, and objectives to minimize potential impacts and create overlay zones for sources of TACs and receptors.

As of May 1, 2011, BAAQMD adopted new requirements that new receptors of TACs located within 1,000 feet from a source consider any increased cancer risk greater than 10 per million persons or non-cancer risk of a 1.0 Hazard Index. Distinct modeling of cancer risk and noncancer risk was not undertaken for the proposed Master Plan, largely because specific project details cannot be known due to the programmatic nature of the Master Plan. To this effect, Impact 4.6.5 below assumes that the threshold has been exceeded and mitigation is incorporated to minimize this effect, precluding the need for modeling of exposure risks.

Odors

To have a less than significant impact, the Master Plan must identify the location of existing and planned odor sources in the area. The Master Plan must also include measures to reduce potential odor impacts in the area.

METHODOLOGY

Air quality-related impacts were assessed in accordance with methodologies recommended by BAAQMD and in comparison to the recommended BAAQMD significance thresholds.

In the case of criteria air pollutants, both construction and operational emissions were quantified using the URBEMIS 2007 (v9.2.4)[1] computer program. The URBEMIS 2007 program is designed to model construction emissions for land use development projects and allows for the input of project-specific information. Modeling was based primarily on the default settings contained within the computer program for Contra Costa County and included emissions from off-highway mobile equipment, travel on unpaved surfaces, soil disturbance, and evaporative emissions from asphalt paving and architectural coating applications, as well as on-highway worker commute trips. Regional area- and mobile-source (operational) emissions were calculated for annual operational conditions based on the default parameters contained in the model for the Bay Area. Default trip-generation rates contained in the model were amended to correspond with trip-generation rates identified in the traffic analysis prepared for this project. Modeling was conducted for daily and annual operational conditions. Emissions associated with the use of hearth devices were based on the modeling default assumptions. Air quality modeling is included in **Appendix E**.

IMPACTS AND MITIGATION MEASURES

Violate Air Quality Standard or Contribute Substantially to an Air Quality Violation: Short-Term, Construction Emissions

Impact 4.6.1 Subsequent land use activities associated with implementation of the proposed Master Plan could result in short-term construction emissions that could violate or substantially contribute to violations of federal and state ambient air quality standards. This impact is considered to be **potentially significant**.

Implementation of the proposed Master Plan will result in short-term emissions from construction activities associated with subsequent development, including site grading, asphalt paving, building construction, and architectural coating. Construction-generated emissions are short term and of temporary duration, lasting only as long as construction activities occur, but possess the potential to represent a significant air quality impact. The construction and development of residential, commercial, and office uses would result in the temporary generation of emissions resulting from site grading and excavation, road paving, motor vehicle exhaust associated with construction equipment and worker trips, and the movement of construction equipment, especially on unpaved surfaces. Emissions commonly associated with construction activities include fugitive dust from soil disturbance, fuel combustion from mobile heavy-duty diesel- and gasoline-powered equipment, portable auxiliary equipment, and worker commute trips. During construction, fugitive dust, the dominant source of PM_{10} and $PM_{2.5}$ emissions, is generated when wheels or blades disturb surface materials. Uncontrolled dust from construction can become a nuisance and potential health hazard to those living and working nearby. Emissions of airborne particulate matter are largely dependent on the amount of ground disturbance associated with site preparation activities. Demolition and renovation of buildings can also generate PM_{10} and $PM_{2.5}$ emissions. Off-road construction equipment is often diesel-powered and can be a substantial source of NO_X emissions, in addition to PM_{10} and $PM_{2.5}$ emissions. Worker commute trips and architectural coatings are dominant sources of ROG emissions.

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[1] Urbemis is software which uses the URBEMIS land use emissions inventory model to estimate criteria pollutant emissions under particular scenarios involving construction, area, and other sources. It has been designed specifically for California, though a 49 states version is in development, and uses California-specific road and construction emissions factors. The URBEMIS 2007 model uses the California Air Resources Board's EMFAC2007 model for on-road vehicle emissions and the OFFROAD2007 model for off-road vehicle emissions.

The predicted maximum daily construction-generated emissions of ROG, NO_x, and particulate matter (PM_{10} and $PM_{2.5}$) associated with project construction are summarized in **Table 4.6-6**. Based on the modeling conducted, maximum unmitigated construction-generated emissions of NO_x and PM would occur during the initial site preparation/grading of the project site. Emissions of ROG would largely occur during the building construction phase, associated with the application of architectural coatings. As indicated in **Table 4.6-6**, emissions would vary depending on the project phase and the specific land uses being constructed. Maximum daily emissions would total approximately 42 pounds per day (lbs/day) of ROG, 48 lbs/day of NO_x, 90 lbs/day of PM_{10}, and approximately 20 lbs/day of $PM_{2.5}$. Actual daily emissions would vary from day to day and would be dependent on the specific activities conducted.

Maximum daily emissions during construction would be above the BAAQMD significance threshold of 82 pounds per day for PM_{10} during Phase 4. As shown in **Table 4.6-6**, criteria pollutant emissions are projected to be below the significance threshold for every other year of construction.

It is important to note that the land use designations of the Master Plan area include a variety of development types and densities and those used for the purpose of this analysis are based on assumptions. For instance, the Flex land use designation allows for residential, retail, office/commercial, quasi-public uses, or any combination thereof. In order to project reasonable estimates of resultant air pollutant emissions for the purposes of this analysis, an estimated development buildout was determined in the form of expected dwelling units and square footage of nonresidential development (see Section 4.0, Assumptions). The assumed buildout was then divided into six construction phases. The assumptions used to project the assumed buildout and construction phases are based on historic development data, weighted toward residential uses. However, certain considerations are expected to come into play during later development of the Master Plan area, which could deviate from this set of assumptions depending on future market conditions and demand. The amount of air pollutants generated during construction of individual phases would vary depending on numerous factors, and the projected criteria pollutant emissions identified in **Table 4.6-6** are only estimates based on the assumption methodology described in Section 4.0.

TABLE 4.6-6
ESTIMATED SHORT-TERM EMISSIONS OF CRITERIA AIR POLLUTANTS FOR THE PROPOSED MASTER PLAN

Construction Year	Pounds per Day (lbs/day)			
	ROG	NO_x	PM_{10}	$PM_{2.5}$
Construction Phase 1				
2011	7.96	53.88	52.87	13.10
2012	6.99	40.54	2.92	2.56
2013	6.45	37.64	2.67	2.34
2014	28.40	34.88	2.45	2.13
2015	22.44	0.01	0.00	0.00
Construction Phase 2				
2015	3.83	27.84	2.39	1.62
2016	2.14	13.93	0.94	0.86
2017	1.99	12.86	0.85	0.78
2018	3.79	11.84	0.76	0.69

Construction Year	Pounds per Day (lbs/day)			
	ROG	NO_x	PM_{10}	$PM_{2.5}$
Construction Phase 3				
2018	3.73	21.16	32.25	7.19
2019	3.43	19.68	1.28	1.12
2020	3.14	18.37	1.17	1.02
2021	3.04	17.94	1.16	1.01
2022	53.26	17.94	1.16	1.01
West Coast Home Builders				
2022	3.92	22.28	90.23	19.71
2023	3.92	22.28	1.76	1.39
2024	3.92	22.28	1.76	1.39
2025	42.47	22.29	1.77	1.39
2026	42.23	21.40	1.75	1.38
Construction Phase 4				
2026	1.72	11.57	19.12	4.35
2027	1.66	10.34	0.68	0.59
2028	1.66	10.34	0.68	0.59
2029	35.17	10.34	0.68	0.59
Construction Phase 5				
2029	1.72	11.57	24.92	5.56
2030	3.04	18.10	1.19	1.03
2031	36.3	17.98	1.19	1.03
Significance Criteria	***54***	***54***	***82***	***54***
Significant?	No	No	Yes	No

It has not been determined when WCHB will build their portion of the Master Plan. For the sake of determining impacts, it was assumed that they would likely construct in the middle of the project life. Therefore, they were placed between Phases 3 and 4 above.
Emissions calculated using the URBEMIS 2007 computer program. Assumes one-quarter of project phase area actively disturbed on any given day and an overall estimated 4-year construction period for Phase 1, Phase 3, and the WCHB Phase; a 3 year construction period for Phase 2 and Phase 4; and a 2-year construction period for Phase 5.
Includes import of 10,000 cubic yard soil per phase, 16 round trips per day (hauling), round-trip distance of 5.2 miles.

Based on the modeling conducted, estimated short-term daily emissions of ROG, NO_x, and $PM_{2.5}$ associated with the individual project phases would not exceed the BAAQMD-recommended significance threshold of 54 pounds per day. However, emissions would exceed the BAAQMD-recommended PM_{10} significance threshold of 82 lbs/day at the beginning of construction Phase 4 in the year 2022. As noted previously, the Bay Area is currently designated nonattainment for the ozone and PM_{10} ambient air quality standards. Short-term increases of PM could potentially contribute to existing PM_{10} nonattainment conditions. As a result, short-term increases of airborne emissions PM_{10} would be considered **potentially significant**.

Mitigation Measures

MM 4.6.1 All future development in the Master Plan area shall implement BAAQMD-approved criteria air pollutant-reducing Basic Construction Mitigation Measures to the maximum extent feasible, whether or not construction-related emissions exceed applicable thresholds of significance. The developer shall use the best management practices that are in place at the time of development. Current best management practices shall include the following:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.

2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.

3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.

4. All vehicle speeds on unpaved roads shall be limited to 15 mph.

5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

8. All project developers shall post a publicly visible sign with the telephone number and person to contact at the City of Pittsburg regarding dust complaints during any construction activities. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations (BAAQMD 2010).

The above measures or any additional or modified measures listed by the Bay Area Air Quality Management District at the time of construction shall be implemented to the degree mandated by the discretion of the City at the time of issuance of any development permits.

Timing/Implementation:	*As a Condition of Approval for all development permits.*
Enforcement/Monitoring:	*City of Pittsburg Development Services Department*

This mitigation measure would require the watering of all exposed surfaces two times per day, among other measures. Based on the proposed project phasing schedules, and with implementation of the above mitigation measures, maximum predicted construction-generated emissions would be reduced to approximately 42 pounds per day (lbs/day) of ROG, 48 lbs/day of NO_x, 52 lbs/day of PM_{10}, and approximately 12 lbs/day of $PM_{2.5}$. BAAQMD considers ROG, NO_x, and $PM_{2.5}$ emissions of less than 54 lbs/day and PM_{10} emissions of less than 82 lbs/day to have a less than significant impact. The proposed mitigation measure includes measures recommended by BAAQMD for the reduction of short-term construction-generated emissions. With implementation of proposed mitigation measures, this impact would be considered **less than significant**.

Conflict with the BAAQMD 2010 Clean Air Plan

Impact 4.6.2 Subsequent land use activities associated with implementation of the proposed Master Plan would result in increased population and vehicle miles traveled over current conditions. As Clean Air Plan Control Strategies would be applied to the proposed Master Plan via requirements of the General Plan, this impact is considered to be **less than significant.**

Consistency with Ozone Strategy Population Projections

According to the state Department of Finance (DOF 2010), the City of Pittsburg's existing (year 2010) population is 64,967. The proposed Master Plan would accommodate development that could increase population, housing, and employment in the city. According to the City of Pittsburg General Plan 2020: Draft Environmental Impact Report (City of Pittsburg 2001), Pittsburg will have a population of 98,800 in 2020 (the estimated year of General Plan buildout), an increase of approximately 33,833 individuals or an overall increase of approximately 52 percent in comparison to existing conditions.

The proposed Master Plan would be expected to result in the development of 1,168 new residential units in the city over the next 20 years (though it should be noted that the project does not require that this extent of development occur). Based on the City's average household size of 3.20 persons, the development and occupation of 1,168 new residential units in the city would result in a population increase of approximately 3,738 persons. Therefore, the proposed Master Plan would not instigate population growth beyond that identified in the City of Pittsburg General Plan. (The reader is referred to Section 4.2, Population and Housing, for more information.)

Consistency with BAAQMD 2010 Clean Air Plan

The *Bay Area 2010 Clean Air Plan* includes numerous control measures related to reducing emissions from stationary and mobile sources of emissions. **Table 4.6-7** provides a summary of Pittsburg 2020 General Plan goals and policies, as well as other City regulations that are supportive of control measures most applicable to the proposed Master Plan. A summary description of each Clean Air Plan control measure is included along with a listing of the most relevant City guidelines that support Clean Air Plan control measures. General Plan policies require compliance with these measures as a condition of future development, including within the Master Plan Area. It is important to note that **Table 4.6-7** only provides a summary of the most relevant adopted City regulatory guidelines that relate to the Clean Air Plan control measures.

TABLE 4.6-7
CONSISTENCY WITH BAAQMD'S 2010 CLEAN AIR PLAN

2010 Clean Air Plan Control Strategies	General Plan Goals and Policies that Provide Consistency	Master Plan Standards and Features the Provide Consistency
MSM A-1 – Promote Clean, Fuel-Efficient Light and Medium-Duty Vehicles. Brief Summary: The Air District, in cooperation with local businesses, city and county governments, and state and federal agencies, will expand the use of Super Ultra-low Emission (SULEV) and Partial-Zero (ZEV) emission light-duty passenger vehicles and trucks within the Bay Area. **MSM A-2 – Zero Emission Vehicles (ZEV) and Plug-in Hybrids** **Brief Summary:** The Air District, in cooperation with local businesses, city and county governments, and state and federal agencies, will expand the use of Zero Emission (ZEV) and Plug-in Hybrid (PHEV) passenger vehicles and light-duty trucks within the Bay Area.	The City of Pittsburg General Plan supports these efforts by implementation of various policies, including Policy 9-P-32.	-
TCM C-1 – Voluntary Employer-Based Trip Reduction Programs **Brief Summary:** This measure will support voluntary efforts by Bay Area employers to encourage their employees to use alternative commute modes, such as transit, ridesharing, bicycling, walking, telecommuting, etc.	The City of Pittsburg supports these efforts by implementation of various policies, including Policy 9-P-31.	The Master Plan supports these efforts through Travel Demand Management (TDM) guidelines in Chapter 6
TCM C-2 – Safe Routes to Schools and Safe Routes to Transit Programs **Brief Summary:** This measure will facilitate safe routes to schools and transit by providing funds and working with transportation agencies, local governments, schools, and communities to implement safe access for pedestrians and cyclists. Likely projects will include implementation of bicycle facilities, such as lanes, routes, paths, and parking, and improvements to pedestrian facilities, such as sidewalks/paths, benches, reduced street width, reduced intersection turning radii, crosswalks with activated signals, curb extensions/bulbs, buffers between sidewalks and traffic lanes and streets trees.	The City of Pittsburg supports these efforts by implementation of various goals and policies, including Goals 7-G-10, 7-G-11, 7-G-12, 7-G-14, 7-G-15, and 9-G-11 and Policies 7-P-33, 7-P-34, 7-P-35, and 7-P-39.	The Master Plan supports these efforts through the creation of an integrated pedestrian and bicycle network, pedestrian friendly roadway design, and other measures included in Chapters 6 and 7.

2010 Clean Air Plan Control Strategies	General Plan Goals and Policies that Provide Consistency	Master Plan Standards and Features the Provide Consistency
TCM C-3 – Ridesharing Services and Incentives **Brief Summary:** This measure will promote ridesharing services and incentives through the implementation of the 511 Regional Rideshare Program, as well as local rideshare programs implemented by Congestion Management Agencies. These activities will include marketing rideshare services, operating the rideshare information call center and website, and providing vanpool support services. In addition, this measure includes provisions for encouraging car- sharing programs where appropriate.	The City of Pittsburg supports these efforts by implementation of various policies, including Policies 7-P-55, 7-P-56, and 7-P-57 and Goal 9-G-11.	The Master Plan supports these efforts through TDM measures in Chapter 6.
TCM D-1 – Bicycle Access and Facilities Improvements **Brief Summary:** TCM D-1 will expand bicycle facilities serving employment sites, educational and cultural facilities, residential areas, shopping districts, and other activity centers. Typical improvements include bike lanes, routes, paths, and bicycle parking facilities. This TCM also includes improving bicycle access to transit and supporting the annual Bike to Work event.	The City of Pittsburg supports these efforts by implementation of various goals and policies, including Goals 7-G-10, 7-G-11, 7-G-12, 7-G-16, and 9-G-11 and Policies 7-P-33, 7-P-34, 7-P-43 through 7-P-54, and 7-P-57.	The Master Plan supports these efforts through mandated bicycle standards and design guidelines in Chapter 7.
TCM D-2 – Pedestrian Access and Facilities Improvements **Brief Summary:** TCM D-2 will improve pedestrian facilities and encourage walking by funding projects that improve pedestrian access to transit, employment and major activity centers. Improvements may include sidewalks/paths, benches, reduced street width, reduced intersection turning radii, crosswalks with activated signals, curb extensions/bulbs, buffers between sidewalks and traffic lanes, and street trees.	The City of Pittsburg supports these efforts by implementation of various goals and policies, including Goals 7-G-11, 7-G-14, and 7-G-15 and Policies 7-P-33, 7-P-34, and 7-P-39 through 7-P-42.	The Master Plan supports these efforts through an integrated pedestrian network and other features in Chapter 7 as well as pedestrian standards and street designs in Chapter 6.
TCM D-3 – Local Land Use Strategies **Brief Summary:** TCM D-3 will support and promote land use patterns, policies, and infrastructure investments that support higher density mixed-use, residential and employment development near transit in order to facilitate walking, bicycling and transit use.	The City of Pittsburg supports these efforts by implementation of various policies, including Goals 7-G-8, 7-G-11, and 9-G-11 and Policies 7-P-26, 7-G-28, and 9-P-31.	The Master Plan supports these efforts directly through the Land Use Plan in Chapter 4.

2010 Clean Air Plan Control Strategies	General Plan Goals and Policies that Provide Consistency	Master Plan Standards and Features the Provide Consistency
TCM E-2 – Promote Parking Policies to Reduce Motor Vehicle Travel **Brief Summary:** Parking policies and practices have a profound impact on vehicle travel and mode choice, as well as land use patterns and the quality of the built environment. Parking policies are also an important tool in implementing focused growth strategies. This control measure outlines how the Air District, in cooperation with its regional agency partners, will (1) take actions at the regional level to implement parking policies that will benefit air quality, and (2) encourage and support local agency parking policies to reduce motor vehicle travel and promote focused growth.	The City of Pittsburg supports these efforts by implementation of various policies, including Policy 7-P-11 and 7-P-57.	The Master Plan supports these efforts through TDM measures in Chapter 6 as well as pedestrian improvements and standards in Chapter 7.
ECM 1 – Energy Efficiency **Brief Summary:** This control measure consists of three components: (1) provide education and outreach to increase energy efficiency in residential and commercial buildings and industrial facilities, (2) provide technical assistance to local governments to adopt and enforce energy efficiency building codes, and (3) provide incentives for increasing energy efficiency at schools.	The City of Pittsburg supports these efforts by implementation of various policies, including Policies 9-P-31 and 9-P-33.	The Master Plan supports these efforts through Development Standards and Design Guidelines, including a requirement that project exceed Title 24 energy efficiency standards by 15 percent.
ECM 2 – Renewable Energy **Brief Summary:** This control measure consists of two components: (1) promote incorporation of renewable energy sources into new developments and redevelopment projects, and (2) foster innovative renewable energy projects through provision of incentives. Note: In addition, as part of the Further Study Measure entitled "Enhancement to Energy Measures," the District will evaluate the cost-effectiveness of solar thermal technology for consideration as a potential solar hot water heating rule.	Pittsburg Power Company (PPC) is a Joint Powers Authority between the City of Pittsburg and the Redevelopment Agency. PPC aggressively pursues regional energy projects while diligently working with local industrial and commercial companies and entrepreneurs to promote new power generation technologies, renewable energy resources, and other unique energy project applications.	The Master Plan supports these efforts through recommendations and consideration of solar energy in Chapter 5.

2010 Clean Air Plan Control Strategies	General Plan Goals and Policies that Provide Consistency	Master Plan Standards and Features the Provide Consistency
ECM 3 – Urban Heat Island Mitigation **Brief Summary:** The control measure includes regulatory and educational approaches to reduce the "urban heat island" (UHI) phenomenon by increasing the application of "cool roofing" and "cool paving" technologies.	The City of Pittsburg supports these efforts by implementation of various policies included in the 2010 Housing Element, including the Installation of "cool roofs" that reflect solar radiation to lower heating costs and reduce the urban heat island effect. This effort is also supported by the City's Green Building Design Guidelines (adopted with Planning Commission Resolution No. 9864 on November 9, 2010).	The Master Plan supports these efforts through green building recommendations in Chapter 5.
ECM 4 – Shade Tree Planting **Brief Summary:** The control measure includes voluntary approaches to reduce the "urban heat island" phenomenon by increasing shading in urban and suburban communities through planting of (low VOC-emitting) trees and preservation of natural vegetation and ground cover.	The City of Pittsburg supports these efforts by implementation of various policies, including, but not limited to, Housing Element Policy P-5.2. This effort is also supported by the City's Green Building Design Guidelines (adopted with Planning Commission Resolution No. 9864 on November 9, 2010).	The Master Plan supports these efforts through required planting of shade trees, as described in Chapter 5.
FSM 13 – Energy Efficiency and Renewable Energy **Brief Summary:** Many agencies are already involved in issuing building standards and promoting energy efficiency and renewable energy. It is important to determine the proper role and added value that the District could bring to energy use in the buildings sector in light of constraints related to legal authority, potential enforcement mechanisms, in-house experience and expertise, available resources, and existing regulatory structures.	The City of Pittsburg supports these efforts by implementation of various policies, including, but not limited to, Policies 9-P-31 and 9-P-33.	The Master Plan supports these efforts through Development Standards and Design Guidelines, including a requirement that project exceed Title 24 energy efficiency standards by 15 percent.

As shown in **Table 4.6-7**, through consistency with General Plan and other municipal requirements enforced by the City for all future development, the proposed Master Plan would be consistent with the control measures identified in the *Bay Area 2010 Clean Air Plan* due to City guidelines that support Clean Air Plan control measures, so is therefore consistent with the assumptions contained in the BAAQMD *2010 Clean Air Plan*. Furthermore, the proposed Master Plan would not instigate population growth beyond that identified in City of Pittsburg General Plan. This impact would be considered **less than significant**.

Mitigation Measures

None required.

Violate Air Quality Standard or Contribute Substantially to an Air Quality Violation: Long-Term, Operational Emissions

Impact 4.6.3 Subsequent land use activities associated with implementation of the proposed Master Plan could result in long-term, operational emissions that could violate or substantially contribute to violations of federal and state ambient air quality standards. This impact is considered to be **potentially significant**.

Implementation of the proposed Master Plan would result in the development and operation of new land uses, which would generate increased air emissions. For comparison purposes, projected increases in emissions associated with projected future development, with and without implementation of the proposed project, are summarized in **Table 4.6-8**. As depicted, the proposed Master Plan would result in net increases of approximately 41 tons per year of ROG, 28 tons per year of NO_X, 37 tons per year of PM_{10}, and 10 tons per year of $PM_{2.5}$. According to these estimates, mobile sources are the largest contributor of air pollutant emissions. Future development attributable to the proposed Master Plan would be anticipated to result in increased emissions from both area and mobile sources.

TABLE 4.6-8
PROPOSED MASTER PLAN LONG-TERM OPERATIONAL EMISSIONS

Scenario	Annual Emissions (tons/year)			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Master Plan Buildout				
Area Sources	19.00	2.29	3.91	3.76
Mobile Sources	22.01	25.85	33.62	6.46
Total	**41.01**	**28.14**	**37.53**	**10.22**

Notes: Emissions were quantified using the URBEMIS 2007 computer program. Area source emissions include emission associated with natural gas use, landscape maintenance, architectural coatings, and consumer products. Total emissions are based on the following assumptions:
Master Plan Buildout: Assumes 1,168 dwelling units, 45.3 KSF retail, 50.53 KSF regional commercial,34.36 KSF general office buildings, and 16.17 KSF office park. Assumes 107,000 vehicle miles traveled/day.

Based on the modeling conducted, estimated operational emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ associated with buildout of the proposed Master Plan would exceed the BAAQMD-recommended significance thresholds of 10 tons per year of ROG, NO_X, and $PM_{2.5}$ and 15 tons per year of PM_{10}. As operation emissions at buildout of the proposed Master Plan would result in exceedence of BAAQMD significance thresholds, this impact would be considered **significant and unavoidable**.

Mitigation Measures

There is no feasible mitigation available to reduce this impact to a less than significant level beyond redesigning the project to substantially limit the amount of residential units and/or commercial uses. However, one of the objectives of the proposed Master Plan is to promote sustainable development characterized by a mix of uses and a circulation system that prioritizes pedestrians, bicyclists, and transit riders over single-occupancy vehicles. Limiting either the residential or commercial aspects of the Master Plan could actually increase vehicle miles traveled and thus criteria air pollutant emissions in the city over the long term, as there would be less linkage between city residences and BART transit.

While the total trips would increase over current conditions due to the project, the overall local and regional goals of supporting development of high density, mixed use infill development within one-half mile of existing transit in combination with transportation and parking demand management policies within the proposed Master Plan (i.e. parking maximums, and providing a strong pedestrian, transit, bicycle access environment as well as supporting alternative access programs as set forth in Chapter 6 of the Master Plan, and supporting documents). The Master Plan would serve to support a truly multi-modal environment thereby ultimately reducing vehicle miles traveled both within and from the project area.

In addition to the overall nature of the project, the proposed Master Plan includes several green design requirements, as codified in Section 5 of the Master Plan. Included in these measures is a requirement to exceed California minimum energy efficiency standards (Title 24, Part 6) by 15 percent[2]. Future development proposals within the Master Plan Area would be required to demonstrate compliance with these green building standards.

Further air quality mitigation is provided by the City's requirements that street lights and signals be lit by LEDs, which use much less electricity than standard incandescent light bulbs and reduce emissions as a result of power generation. Future development projects would be required to pay their fair share into the City's Lighting & Landscaping District, which is currently replacing street lighting with LED lighting in the City (including in the immediately vicinity of the Master Plan Area). Future development projects would likewise pay their fair share into the Pittsburg Local Transportation Mitigation Fee, which funds installation of LED signaling. Furthermore, current City Engineering Standards require the installation of signaling approved by the Engineering Division – which requires that new signals utilize LED technology.

While the following mitigation measure would not result in a less than significant determination for the proposed Master Plan, it would serve to further reduce the intensity of the significant air quality impact.

MM 4.6.3 To the greatest extent feasible, future development proposals in the Master Plan Area shall comply with the City's adopted Green Building Design Guidelines, or any applicable City green/efficient building regulations which are in effect at the time of development.

[2] Energy efficiency beyond that required by Title 24 is recommended by BAAQMD as a method of reducing energy use of a project and thus criteria emissions created by power generation. Specific efficiencies beyond Title 24 vary throughout the state. 15 percent is a general average of similar requirements placed on other development in the state.

Timing/Implementation: *Prior to issuance of Building Permits.*

Enforcement/Monitoring: *City of Pittsburg Development Services Division.*

As previously mentioned, there is no feasible mitigation available to reduce this impact to a less than significant level beyond redesigning the project to substantially limit the amount of residential units and/or commercial uses. However, while mitigation measure **MM 4.6.3** would not result in a less than significant determination for the proposed project, it would assist to reduce the intensity of resultant significant air quality impacts. Regardless, this impact would remain **significant and unavoidable**.

Exposure of Sensitive Receptors to Substantial Concentrations of Mobile-Source Carbon Monoxide

Impact 4.6.4 Implementation of the proposed Master Plan would not result in increased population and employment that would result in level of service operations that would be inconsistent with the region's congestion management program. This is considered to be a **less than significant** impact.

Localized carbon monoxide (CO) concentrations near roadway intersections are a function of traffic volume, speed, and delay. Transport of CO is extremely limited because it disperses rapidly with distance from the source under normal meteorological conditions. Under specific meteorological conditions, CO concentrations near roadways and/or intersections may reach unhealthy levels with respect to sensitive receptors, often referred to as a "CO hotspot."

Based on BAAQMD guidance, projects meeting all of the following screening criteria would be considered to have a less than significant impact to localized CO concentrations (BAAQMD 2010a):

- Project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans; and
- The project traffic would not increase traffic volumes at affected intersections to more
- than 44,000 vehicles per hour; and
- The project would not result in an affected intersection experiencing more than 44,000 vehicles per hour or 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).

The 2009 Contra Costa Congestion Management Program (CMP) requires each jurisdiction to identify existing and future transportation facilities that would operate below an acceptable service level and provide mitigation where future growth would degrade that service level. The Contra Costa Transportation Authority (CCTA) serves as the congestion management agency responsible for the CMP. As part of eastern Contra Costa County, the City of Pittsburg works with other east county jurisdictions through the Eastern Contra Costa Transit Authority (Tri Delta Transit) to develop transit options as well as through the East County Action Plan. The action plan identifies multimodal traffic service objectives for routes of regional significance, which in Pittsburg include the freeway (State Route 4) and arterial streets (such as Bailey Road, Leland

Road, Willow Pass Road, Buchanan Road, and Kirker Pass Road). On these arterials, the multimodal traffic service objectives set a target level of service.

There are 14 overarching goals established for the East County Action Plan including highway facility improvement goals, the development of rail transit opportunities, encouraging biking and pedestrian modes of transport, and the expansion of transit. The proposed Master Plan would be strategically located adjacent to regional mass transit (BART station) and has been designed to reduce the environmental impact of land use development by increasing the viability of walking with clustered, mixed-use development design concepts. The identified objectives for the proposed Master Plan include supporting walking and bicycling and improving pedestrian and bicycle linkages to/from the BART station, the establishment of the BART station area as a regional focal point, the reduction of greenhouse gas emissions and automobile trips by promoting sustainable development characterized by a mix of uses and a circulation system that prioritizes pedestrians, bicyclists, and transit riders over single-occupancy vehicles, and an increase in transit ridership by developing a multimodal transit hub. As a result of these Master Plan objectives and development design, the Master Plan would not conflict with the East County Action Plan.

Based on the traffic analysis, peak hour volumes at several intersections along key corridors serving the Master Plan vicinity, such as the Bailey Road and West Leland Road intersection during peak PM hours and the Bailey Road and Concord Boulevard intersection in the peak AM hours, would be negatively impacted by the projects contribution to local traffic. Under Master Plan buildout conditions, these intersections would be anticipated to be primarily affected, operating at levels of service (LOS) of LOS E or worse. However, traffic volumes under peak-hour conditions at these intersections would not be projected to exceed BAAQMD's screening criteria of 44,000 vehicles per hour since the Master Plan is not anticipated to add a significant amount of new traffic volume that would result in higher CO emissions. In addition, these intersections would not experience limitations with regard to vertical or horizontal mixing (e.g., tunnel, bridge underpass).

The proposed Master Plan would not conflict with the Contra Costa CMP East County Action Plan or result in an area intersection exceeding 44,000 vehicles per hour. This impact is **less than significant**.

Mitigation Measures

None required.

Exposure of Sensitive Receptors to Substantial Concentrations of Toxic Air Contaminant and/or Fine Particulate Matter

Impact 4.6.5 Subsequent land use activities associated with implementation of the proposed Master Plan could result in sources of toxic air contaminants that could affect surrounding land uses. Subsequent land use activities could also place sensitive land uses near existing sources of toxic air contaminants. These factors could result in the exposure of sensitive receptors to substantial concentrations of toxic air contaminants and/or fine particulate matter. This is considered a **potentially significant** impact.

Short-Term Exposure

Construction projects can result in short-term increases of TACs, as well as emissions of airborne fugitive dust. Emissions of diesel particulate matter (DPM) emitted from diesel-fueled construction vehicles are of particular concern. Exposure to DPM results in a greater incidence of chronic non-cancer health effects, such as cough, labored breathing, chest tightness, wheezing, and bronchitis. However, various other TACs from diesel exhaust also contribute to both cancer and non-cancer health risks. Construction-generated emissions of fine particulate matter ($PM_{2.5}$) can also contribute to significant health impacts, particularly among the more sensitive population groups (i.e., children, the elderly, etc.).

To assist local jurisdictions in the analysis of potential health risks associated with short-term construction projects, BAAQMD has developed screening criteria that can be applied at the project level (BAAQMD 2010a). The BAAQMD Construction Risk Calculator model provides distances from a construction site, based on user-provided project data, where the risk impacts are estimated to be less than significant; sensitive receptors located within these distances would be considered to have potentially significant risk and hazards impacts from construction. BAAQMD considers this screening procedure an environmentally conservative guidance.

As previously mentioned, the land use designations of the Master Plan include a variety of development types and densities and these are based on assumptions. An estimated development buildout was determined in the form of expected dwelling units and square footage of nonresidential development (see Section 4.0, Assumptions). The assumed buildout was then divided into six construction phases. The assumptions used to project the assumed buildout and construction phases are based on historic development data, weighted toward residential uses.

Depending on the construction activities required and distances to nearby receptors, it is conceivable that some development within the Master Plan area may be large enough such that the project-level significance thresholds would be exceeded. According to the BAAQMD Construction Risk Calculator model (BAAQMD 2010c), the minimum distance required between the fence line of construction and the nearby sensitive receptors to the south of the Master Plan area just across West Leland Road (residences) to avoid significant health risks would be 985 feet (300 meters) for cancer risk with age sensitivity factors (ASFs), 82 feet (25 meters) for DPM chronic hazard, 820 feet (250 meters) for $PM_{2.5}$, 492 feet (150 meters) for acrolein acute hazard, and 40 feet (12 meters) for acrolein chronic hazard (acrolein has been highlighted by the US EPA as a priority air toxic. It is considered one of the most toxic TACs associated with diesel exhaust based on its non-cancer toxicity value) (BAAQMD, 2010c). The worst-case screening distance is 985 feet (300 meters) for cancer risk with ASFs. As such, it is possible that construction near the southern or western boundaries (assuming Alves Ranch is constructed and occupied during that time) could expose existing residents to significant TACs during construction, creating a potentially significant impact.

Long-Term Exposure

Development of future land uses may include potential stationary sources of TACs, such as diesel-powered emergency-use power generators. Depending on the type and requirements of senior housing to be included in the Master Plan area, generators may be included in that portion of the Master Plan area, though it is unlikely. While such equipment is not expected to be utilized by any other use in the Master Plan area, the quasi-public, commercial, and retail aspects of flex uses may include health care facilities that require such equipment. The type and level of TAC emissions emitted would depend on the nature of the land use and the specific methods and operations that involve toxic air emissions. Pursuant to BAAQMD rules and regulations, including BAAQMD Regulation 2, Rule 5 (new Source Review of Toxic Air Contaminants), major stationary sources having the potential to emit TACs are required to obtain permits from BAAQMD. Permits may be granted to these operations provided they are constructed and operated in accordance with applicable BAAQMD rules and regulations. Given that compliance with applicable standards and regulations would be required as a part of normal permit procedure, TAC emissions from new major stationary sources would not be anticipated to result in an increased risk to nearby sensitive receptors that would exceed applicable significance thresholds. However, some aspects of the Master Plan may include the operation of other mobile sources of TAC and/or $PM_{2.5}$ emissions. For instance, commercial uses that would attract high numbers of diesel-powered on-road haul trucks or use off-road diesel equipment on site, such as a distribution center or large-scale grocer, could potentially expose receptors to substantial risk levels and/or health hazards (BAAQMD 2010a). The Keller Canyon Landfill is located approximately 0.9 miles south of the project site. While the access for the landfill is located on Bailey Road, the landfill itself is set back from the roadway more than 1,900 feet, providing additional buffer from the uses of the Master Plan Area. Given the topography between the landfill and the Master Plan Area and the distance from the Master Plan Area and the landfill itself, the landfill is not expected to be a significant source of emissions that would impact the proposed Master Plan.

In addition to long-term exposure to stationary emission sources, new land uses may also be exposed to emissions from mobile sources. To assist local jurisdictions in the evaluation of community risk and hazard impacts, BAAQMD recommends that land use plans like the proposed Master Plan establish special overlay zones around existing and planned land uses that emit TACs; establish special overlay zones of at least 500 feet on each side of all freeways and high-volume roadways; and identify goals, policies, and objectives to minimize potential impacts and create overlay zones for sources of TACs and receptors (BAAQMD 2010a). According to information provided by BAAQMD for the Master Plan, the actual area of possible effect in the vicinity of the project site may exceed this 500 foot recommendation.

State Route 4 traverses in a west-east direction just north of the Master Plan area and is considered a major source of TAC emissions. To a lesser extent, trains traveling along the BART light-rail corridor in the center of State Route 4 would also contribute to localized concentrations of TACs near the proposed Master Plan area. However, CARB considers major service and maintenance rail yards as potential sources of TACs. The operation of rail lines outside of rail yards has not been identified as a major source of TACs that pose a significant risk to sensitive receptors.

The proposed Master Plan would include opportunities for new development within 500 feet (152 meters) of State Route 4 and may involve the operation of other mobile sources of TACs/ $PM_{2.5}$, resulting in potentially significant impacts. When combined with potential short-term construction impacts, the proposed Master Plan would have a **significant** impact.

Mitigation Measures

MM 4.6.5a Tiered plantings of trees such as redwood, deodar cedar, live oak, and oleander shall be installed between State Route 4 and the proposed Master Plan area in order to reduce TAC and PM exposure.[3]

Timing/Implementation: *As a Condition of Approval for any project within 500 feet of State Route 4*

Enforcement/Monitoring: *City of Pittsburg Development Services Department*

MM 4.6.5b As a part of future development proposals in the Master Plan Area, the project proponent(s) shall secure the services of a qualified air quality professional for the preparation of site-specific air quality modeling, as required by the Bay Area Air Quality Management District (BAAQMD). If site-specific modeling indicates that significant exposure to criteria pollutants, including toxic air contaminants, would occur, future development shall comply to the maximum extent feasible with mitigation measures provided by BAAQMD for the reduction of air quality impacts. These measures shall comply with the most current regulations available at the time of development and will likely include the following measures:

- Modification to the location and height of intakes to the ventilation system;
- Addition of HEPA air filtration systems;
- Limiting the placement of recreational use areas, such as patio areas and balconies, to interior courtyards requiring that they be shielded by the structure;
- Triple-paned windows;
- Central heating, ventilation, and air conditioning (HVAC) systems with high-efficiency filters,
- Locating air intake systems for the HVAC systems as far away from the roadway as possible; and/or
- An ongoing HVAC maintenance plan.

These measures shall be designed and implemented to the satisfaction of the City in consultation with BAAQMD. Site-specific modeling shall be conducted

[3] This recommendation is based on a laboratory study that measured the removal rates of PM passing through leaves and needles of vegetation. Particles were generated in a wind tunnel and a static chamber and passed through vegetative layers at low wind velocities. Redwood, deodar cedar, live oak, and oleander were tested. The results indicated that all forms of vegetation were able to remove 65–85 percent of very fine particles at wind velocities below 1.5 meters per second (approximately 3 miles per hour), with redwood and deodar cedar being the most effective (BAAQMD 2010a). Even greater removal rates were predicted for ultra-fine PM (i.e., aerodynamic resistance diameter of 0.1 micrometer or less) (BAAQMD 2010a).

for all development within the project area and shall use the most current standards and mitigation applicable at the time of the modeling are included.

Timing/Implementation:	*Prior to approval of any planning entitlements for development projects in the Master Plan Area.*
Enforcement/Monitoring:	*City of Pittsburg Development Services Department in consultation with the Bay Area Air Quality Management District.*

MM 4.6.5c All construction within the Master Plan area shall implement measures to reduce the emissions of TAC pollutants generated by heavy-duty diesel-powered equipment during construction.

a. Keep all construction equipment in proper tune in accordance with manufacturer's specifications.

b. Use late model heavy-duty diesel-powered equipment during construction to the extent that it is readily available in the San Francisco Bay Area.

c. Use diesel-powered equipment that has been retrofitted with after-treatment products (e.g., engine catalysts) to the extent that it is readily available in the San Francisco Bay Area.

d. Use low-emission diesel fuel for all heavy-duty diesel-powered equipment operating and refueling at construction sites to the extent that it is readily available and cost effective in the San Francisco Bay Area (this does not apply to diesel-powered trucks traveling to and from the site).

e. Utilize alternative fuel construction equipment (i.e., compressed natural gas, liquid petroleum gas, and unleaded gasoline) to the extent that the equipment is readily available and cost effective in the San Francisco Bay Area.

f. Limit truck and equipment idling time to five minutes or less.

g. Rely on the electricity infrastructure surrounding the construction sites rather than electrical generators powered by internal combustion engines to the extent feasible.

Timing/Implementation:	*As a Condition of Approval for any grading or construction permit*
Enforcement/Monitoring:	*City of Pittsburg Development Services Department*

Compliance with applicable BAAQMD standards and regulations regarding stationary sources of TACs requires major stationary sources having the potential to emit TACs to obtain permits from BAAQMD. Permits may be granted to these operations provided they are constructed and operated in accordance with applicable BAAQMD rules and regulations. Given that compliance with applicable standards and regulations would be required for any use requiring such a permit, TAC emissions from new major stationary sources would not be anticipated to result in an increased risk to nearby sensitive receptors that would exceed applicable significance thresholds. In addition, the above mitigation would require the use of site-specific modeling, as well as protective construction materials on residential units to ensure TAC exposure to residents is reduced during Master Plan operations. The above mitigation also requires the tiered planting of trees to reduce the movement of particulate matter from State Route 4. Regulations on diesel-powered construction equipment would also be required. For these reasons, this impact is considered **less than significant**.

Create Objectionable Odors Affecting a Substantial Number of People

Impact 4.6.6 Subsequent land use activities associated with implementation of the proposed Master Plan would not create objectionable odors affecting a substantial number of people or expose new residents to existing sources of odor. Thus, this impact is considered to be **less than significant**.

Subsequent land use activities associated with implementation of the proposed Master Plan could allow for the development of uses that have the potential to produce odorous emissions either during the construction or operation of future development. Additionally, subsequent land use activities could potentially allow for the construction of sensitive land uses (e.g., residential development, parks, and offices) near future sources of odorous emissions such as commercial land uses allowed under the Master Plan.

Future construction activities could also result in odorous emissions from diesel exhaust associated with construction equipment. However, because of the temporary nature of these emissions and the highly diffusive properties of diesel exhaust, exposure of sensitive receptors to these emissions would be limited.

To assist local jurisdictions in the evaluation of odor-related impacts for general plans and other similar land use programs (including the proposed Master Plan), BAAQMD recommends that for the Master Plan to have a less than significant impact it must identify the location of existing and planned odor sources in the Master Plan area and must also include policies to reduce potential odor impacts in the plan area (BAAQMD 2010a). Major sources of potential odors identified by BAAQMD include wastewater treatment plants, wastewater pumping facilities, sanitary landfills, transfer stations, composting facilities, petroleum refineries, asphalt batch plants, chemical and fiberglass manufacturing, painting/coating operations, food processing facilities, and green waste and recycling operations. None of these operations are proposed as part of the Master Plan. The Master Plan area is surrounded on three sides (north, west, and south) by existing residential development and on the west by approved residential and commercial development projects that have yet to be constructed. No known or suspected sources of substantial odors are located within the vicinity of the Master Plan Area, nor are any such uses proposed (see Section 4.0). In addition, all new uses and development must comply with Pittsburg Municipal Code section 18.82.045, which prohibits any use from producing an unreasonable or disturbing odor at the property line of the site on which it is situated. Therefore, odor-related impacts associated with the proposed Master Plan would be **less than significant**.

Mitigation Measures

None required.

4.6.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The setting for the cumulative air quality analysis consists of the San Francisco Bay Area Air Basin.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Result in a Cumulatively Considerable Net Increase of Nonattainment Criteria Pollutants and Precursors

Impact 4.6.7 Implementation of the proposed Master Plan, in combination with cumulative development in the SFBAAB, would result in a cumulatively considerable net increase of ozone and coarse and fine particulate matter. This is considered a **cumulatively considerable** impact.

As previously identified under Impact 4.6.3, the proposed Master Plan would result in increased VMT that would exceed the BAAQMD-recommended significance thresholds of 10 tons per year of ROG, NO_x, and $PM_{2.5}$ and 15 tons per year of PM_{10}.

The proposed Master Plan would be strategically located adjacent to regional mass transit (BART station) and has been designed to reduce the environmental impact of land use development by developing on an infill site, and increasing the viability of walking with clustered, mixed-use development design concepts. Such concepts would reduce emissions from area and mobile sources. However, the projected increase of criteria pollutant emissions would still exceed the pollutant emission thresholds. As a result, future development associated with the proposed project may interfere with future attainment and/or maintenance of ambient air quality standards.

The design of the proposed Master Plan along with implementation of mitigation measure **MM 4.6.3** would assist in reducing the proposed project's contribution to cumulative air quality impacts. However, this alone may not be sufficient to reduce this impact to a less than significant level. Because the proposed Master Plan would contribute to a cumulative increase in criteria pollutants, the Master Plan's contribution to the cumulative impact is considered **cumulatively considerable** and thus a **significant and unavoidable** impact.

Mitigation Measures

There are no feasible mitigation measures that can completely offset air pollutant emissions from subsequent development under the proposed Master Plan, save for prohibiting the project entirely. As that would result in every single project goal becoming unobtainable, it is not a feasible option. However, implementation of mitigation measure **MM 4.6.3** above would reduce the intensity of the impact – though it would remain **significant and unavoidable**. As noted above, although the project's impacts would be cumulatively considerable, the project would fulfill overarching local and regional goals of supporting development of high density, mixed use infill development within one-half mile of existing transit in combination with transportation and parking demand management policies within the proposed Master Plan (i.e. parking maximums, and providing a strong pedestrian, transit, bicycle access environment as well as supporting alternative access programs as set forth in Chapter 6 of the Master Plan, and supporting documents). The Master Plan would serve to support a truly multi-modal environment thereby ultimately reducing vehicle miles traveled both within and from the project area.

REFERENCES

Bay Area Air Quality Management District (BAAQMD). 2010a. *California Environmental Quality Act Guidelines.*

———. 2010b. Air Quality Standards and Attainment Standards. http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm (accessed October 7, 2010).

———. 2010c. *Screening Tables for Air Toxics Evaluation During Construction.*

———. 2010d. *Bay Area 2010 Clean Air Plan.*

California Air Resources Board (CARB). 2005. *Air Quality and Land Use Handbook: A Community Health Perspective.*

———. 2009. *The California Almanac of Emissions and Air Quality: 2009 Edition*.

———. 2010a. Ambient Air Quality Standards. http://www.arb.ca.gov/research/aaqs/aaqs2.pdf (accessed October 7, 2010).

———. 2010b. Air Quality and Emissions http://www.arb.ca.gov/aqd/aqdpage.htm (accessed October 7, 2010).

California Department of Finance (DOF). 2010. *E-5 Population and Housing Estimates for Cities, Counties, and the State, 2001 – 2010, with 2000 Benchmark.* http://www.dof.ca.gov/research/demographic/.

City of Pittsburg. 2001. *City of Pittsburg General Plan 2020: Draft Environmental Impact Report.*

Contra Costa Transportation Authority (CCTA). 2009. *Contra Costa Congestion Management Program*.

El Dorado County Air Pollution Control District (EDCAPCD). 2002. *Guide to Air Quality Assessment: Determining Significance of Air Quality Impacts Under the California Environmental Quality Act.*

U.S. Environmental Protection Agency (EPA). 2010. *Monitor Values Report: Criteria Air Pollutants*. http://www.epa.gov/air/data/monvals.html (accessed October, 2010).

4.7 Geology and Soils

This section describes the geology and soil conditions of the Master Plan area and general vicinity. The section also analyzes issues such as potential exposure of people and property to potential geologic and seismic hazards such as earthquakes, expansion, landform alteration, and liquefaction that could occur following implementation of the proposed project. This analysis is based on a review of statutory law and local planning documents including the Pittsburg General Plan and the Environmental Impact Report for the Pittsburg/Bay Point BART Station Area Specific Plan (Contra Costa County, et al. 2001).

4.7.1 EXISTING SETTING

GEOLOGY AND TOPOGRAPHY

Regional Setting

The Master Plan area is located in northeastern Contra Costa County, on the northern flank of the Diablo Range at the southern edge of the Pittsburg-Antioch Plain. The Pittsburg-Antioch Plain is essentially a floodplain of Suisun Bay, which is itself a flooded estuary of the Sacramento River. The river channel was carved through the area during the Pleistocene, a geologic epoch of much lower sea level. The northern half of the plain is currently dominated by saltwater marshes. The southern half of the plain is covered by alluvial materials eroded from the Diablo Range to the south. Alluvial materials were deposited along the length of its base in a series of fans that spread outward across the plain toward Suisun Bay.

Project Area

The topography of the Master Plan area is gentle, with minimal areas of steep slopes. Steep slope areas are found in the extreme southern part of the Master Plan area in drainages immediately east and west of Bailey Road between State Route (SR) 4 and West Leland Road. The project site slopes down from West Leland Road northward toward SR 4. Located immediately adjacent to the Master Plan area to the west is a large soil stockpile on the Alves Ranch property. A portion of that pile intrudes into the Master Plan area, resulting in a limited area of steep slopes. Likewise, steep slopes are located immediately north of the frontage of West Leland Road. Slopes exist in that location because the roadway grade and the rough grade of the Master Plan area are offset by approximately 10 feet. These slopes are a result of grading that occurred on the site and adjacent to it prior to the initiation of the Master Plan preparation process and the release of the Notice of Preparation for the proposed project. However, these features are extremely limited in area, and the overall topography of the Master Plan Area remains generally flat.

Soils found within the Master Plan area are limited to flatland soils, which dominate the alluvial slope from the base of the hills to the south to the Suisun Bay margin estuaries (Contra Costa County/City of Pittsburg 2001, p. 14-1). The soil types found in the Master Plan area and their approximate acreages are shown in **Table 4.7-1**.

TABLE 4.7-1
SOILS FOUND IN THE MASTER PLAN AREA

Soil Name	Slope	Acres (Approximate)
Antioch Loam	2–9 percent	1.6
Capay Clay	0–2 percent	21.2
Diablo Clay	15–30 percent	25.2
Diablo Clay	30–50 percent	2.7

Source: USDA 2010.
Notes: Due to grading activities prior to consideration of the proposed Master Plan, the actual slopes existing on the site do not correspond to those listed by the USDA Soil Survey. The slope indicated in this table does not necessarily correspond to the actual slopes found in the Master Plan area.

FAULTS AND SEISMICITY

Earthquakes can cause strong ground shaking that may damage property and infrastructure. The severity of ground shaking at any particular point is referred to as intensity and is a subjective measure of the effects of ground shaking on people, structures, and earth materials. The intensity of shaking generally decreases with distance away from the source of an earthquake. The level of intensity is commonly defined by comparison to the Modified Mercalli Scale, as shown in **Table 4.7-2**, which subjectively categorizes the intensity on the basis of observed effects of seismic shaking on people and objects. Quantitative measurements of the level of ground motion during an earthquake are made by strong-motion seismographs that measure the acceleration of objects at the ground surface caused by seismic shaking.

TABLE 4.7-2
MODIFIED MERCALLI INTENSITY SCALE FOR EARTHQUAKES

Richter Magnitude Scale	Modified Mercalli Scale	Effects of Intensity
0.1–0.9	I	Not felt except by a very few under especially favorable conditions.
1.0–2.9	II	Felt only by a few persons at rest, especially on upper floors of buildings.
3.0–3.9	III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motorcars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
4.0–4.7	IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motorcars rocked noticeably.
4.6–4.9	V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
5.0–5.5	VI	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
5.6–6.4	VII	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.

Richter Magnitude Scale	Modified Mercalli Scale	Effects of Intensity
6.5–6.9	VIII	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, and walls. Heavy furniture overturned.
7.0–7.4	IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
7.5–7.9	X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
8.0–8.4	XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
8.5+	XII	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Source: USGS 2006

The intensity scale consists of a series of certain key responses such as people awakening, movement of furniture, damage to chimneys, and finally total destruction. Although numerous intensity scales have been developed over the last several hundred years to evaluate the effects of earthquakes, the one currently used in the United States is the Modified Mercalli (MM) Intensity Scale shown in **Table 4.7-2** above. This scale, composed of 12 increasing levels of intensity that range from imperceptible shaking to catastrophic destruction, is designated by Roman numerals. It does not have a mathematical basis; instead it is an arbitrary ranking based on observed effects. The lower numbers of the intensity scale generally deal with the manner in which the earthquake is felt by people. The higher numbers of the scale are based on observed structural damage (USGS 2006).

Local Faults and Seismicity

While no active faults are found within the Master Plan area, several faults are located in close enough proximity to the Master Plan area to cause ground shaking and other potential seismic effects. Those faults that lie within a close enough distance to be felt in the Master Plan area are listed in **Table 4.7-3**. Their approximate distance and direction, as well as the maximum credible earthquake (MCE) each is capable of causing, are listed in the table.

TABLE 4.7-3
FAULTS IN THE VICINITY OF THE MASTER PLAN AREA

Fault	Distance and Relative Direction	Recent Movement[1]	Fault Classification	MCE[1]
San Andreas	37 miles – West	Historic	Active	8.0
Hayward	17 miles – West	Pre-Historic, Holocene	Active	7.5
Calaveras (North)	15 miles – South	Historic, Holocene	Active	7.5
Concord – Green Valley	3 miles – West	Historic, Holocene	Active	6.5
Clayton – Greenville	3 miles – South	Holocene	Active	6.3
Marsh Creek – Greenville	10 miles – Southeast	Historic, Holocene	Active	6.9

Fault	Distance and Relative Direction	Recent Movement[1]	Fault Classification	MCE[1]
Franklin	10 miles – West	Late Pleistocene	Potentially Active	6.8
Black Diamond Area	5 miles – Southeast	Pre-Quaternary	Inactive	n/a
Antioch	7 miles – East	Quaternary	Potentially Active	6.5
Pittsburg	3 miles – East	Unknown	Active	Unknown

Source: City of Pittsburg 2001b.

Notes: [1]Recent movement given in geologic timeframe. Historic = less than 200 years. Holocene = less than 11,700 years. Pre-Quaternary = less than 1.6 million years. Quaternary = undifferentiated, generally meant to be any time prior to 1.6 million years. Pleistocene = less than 2.6 million years.

[2]MCE = Maximum credible earthquake that could theoretically be generated by each fault.

In addition to the faults above, several potentially active faults, or faults that have experienced displacement within the last two million years, occur near the Master Plan area. These include the Kirker Pass and the Black Diamond Area faults. Evidence exists that there has been extensive differential movement along a series of northwest-trending splays of the Kirker Pass and Clayton faults, which are centered within the Mount Diablo foothills and extend northward. These faults currently are considered to be inactive, and earthquakes they could generate likely would be of lesser magnitude than other regional faults and would not be expected to produce surface faulting in the Master Plan area (Contra Costa County/City of Pittsburg 2001, pp. 16-1 and 16-2).

Ground Surface Rupture

In major earthquakes, fault displacement can cause rupture along the surface trace of the fault, leading to severe damage to any structures, roads, and utilities located on the fault trace. Surface rupture generally occurs along an active fault trace, but occasionally displacement along presumably inactive faults also occurs. The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. The law requires the State Geologist to establish regulatory zones (known as Earthquake Fault Zones) around the surface traces of active faults and to issue appropriate maps. The maps are distributed to all affected cities, counties, and state agencies for their use in planning and controlling new or renewed construction. Local agencies must regulate most development projects within the zones. Projects include all land divisions and most structures for human occupancy (CA Geological Survey, 2011). Note that not all faults have an Alquist-Priolo Fault Zone associated with them, only those faults found by the state to have a high potential for surface rupture in the case of a substantial earthquake.

According to the latest maps available from the California Department of Conservation (CA Geological Survey, 2011), the nearest areas to the Master Plan Area containing Alquist-Priolo fault zones are the Walnut Creek quadrangle, located to the southwest of the Master Plan area, and the Vine Hill Quadrangle (located south and west of the Master Plan Area). According to those maps, the nearest Alquist-Priolo fault zone to the Master Plan area is no closer than 5.3 miles to the southwest.

Ground Shaking

Ground motions are dependent primarily on the earthquake magnitude and distance to the seismogenic (rupture) zone. Accelerations also are dependent on attenuation by rock and soil deposits, direction of rupture, and type of fault; therefore, ground motions may vary considerably in the same general area. The Association of Bay Area Governments (ABAG) prepared maps showing the estimated shake potential of communities around the San Francisco Bay Area, including the City of Pittsburg and the Master Plan area. These maps depict the approximate severity of shaking that could be felt in the case of a major event along known faults. Given the proximity of faults in the vicinity of the Master Plan area, the ABAG maps indicate the Master Plan area has to potential to experience moderate to severe shaking in the event of a major earthquake.

EXPANSIVE SOILS

Expansive soils are soils that undergo volumetric change with change in water content. The soil will swell with an increase in moisture content and will shrink with a decrease in moisture content. Soils with high shrink-swell potential generally contain high percentages of certain clay minerals and can cause extensive damage to structures and improvements, though the presence of clay does not necessarily indicate a high expansion potential. The Master Plan area currently contains flatland soils. These soils were identified by the City of Pittsburg as having a minimum potential for expansion or contraction (City of Pittsburg 2001a).

GROUNDWATER

The National Soil Survey provides estimated depths to groundwater according to soil type (USDA 2010). All four soil types found in the Master Plan area exhibit estimated depths to groundwater greater than 80 inches. However the actual depth to groundwater is dependent on many factors, including subsurface strata, depth to bedrock, the nature of the underlying aquifer, and others. As a detailed geologic study of the proposed project site has not been conducted, true depth to groundwater under the Master Plan area is unknown.

LIQUEFACTION

Liquefaction occurs when granular soil below the water table is subjected to vibratory motions, such as produced by earthquakes. With strong ground shaking, an increase in pore water pressure develops as the soil tends to reduce in volume. If the increase in pore water pressure is sufficient to reduce vertical effective stress (suspending the soil particles in water), the soil strength decreases and the soil behaves as a liquid (similar to quicksand). Liquefaction can produce excessive settlement, ground rupture, lateral spreading, or failure of shallow bearing foundations.

Four conditions are generally required for liquefaction to occur:

- The soil must be saturated (relatively shallow groundwater);
- The soil must be loosely packed (low to medium relative density);
- The soil must be relatively cohesionless (not clayey); and
- Ground shaking of sufficient intensity must occur to function as a trigger mechanism.

According to the Pittsburg General Plan (2001b), the City experiences the full range of liquefaction potential. Specifically, high liquefaction potential is identified, via mapping by ABAG, along the lowland areas adjoining the Suisun Bay. Other flatland areas, including the Master Plan area, are not identified by the General Plan as containing a high liquefaction potential (City of Pittsburg 2001b, Figure 10-1). However, as site-specific geologic surveys and investigations have not been undertaken, the specific potential for the Master Plan area to exhibit liquefaction or subsidence in the event of a major seismic event is not known.

4.7.2 REGULATORY FRAMEWORK

STATE

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. The main purpose of the law is to prevent the construction of buildings used for human occupancy on the surface traces of active faults and to issue appropriate maps.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act addresses non-surface fault rupture earthquake hazards, including liquefaction and seismically induced landslides. Passed by the State Legislature in 1990, this law was codified in the California Public Resources Code (PRC) as Division 2, Chapter 7.8A, and became operative in April 1991. According to the Seismic Hazards Maps provided by the California Department of Conservation, the City of Pittsburg is not located in any seismic hazards area (2009).

California Building Standards Code

The State of California provides minimum standards for building design through the California Building Standards Code (CBSC). The CBSC is based on the Uniform Building Code (UBC), which is used widely throughout the United States (generally adopted on a state-by-state or district-by-district basis) and has been modified for conditions within California.

LOCAL

City of Pittsburg General Plan

The General Plan serves as the overriding policy document for land use in the City of Pittsburg. **Table 4.7-4** below provides a list of all applicable geology and seismicity policies and the proposed Master Plan's consistency with those goals and policies. While this DEIR analyzes the Master Plan's consistency with the General Plan pursuant to State CEQA Guidelines Section 15125(d), the Pittsburg City Council has the responsibility of ultimately determining the proposed Master Plan's consistency with the General Plan.

TABLE 4.7-4
PROJECT CONSISTENCY WITH APPLICABLE GENERAL PLAN GEOLOGY AND SEISMICITY POLICIES

General Plan Policies	Consistent with General Plan	Analysis
Goal 10-G-1 – Minimize risk to life and property from geologic and seismic hazards.	Yes	The analysis presented in this section of the DEIR found impacts to be less than significant for all seismic and geologic hazards, save for soil stability and expansion potential. Mitigation measure MM 4.7.3 has been applied in order to reduce those impacts to a less than significant level, ensuring consistency with this goal.
Goal 10-G-2 – Establish procedures and standards for geotechnical review of projects located in areas of steep slopes, unstable soils, or other geologic or seismic risks.	Yes	Mitigation measure MM 4.7.3, requiring all future development in the Master Plan area to have a geotechnical analysis prepared which identifies any geologic or seismic concerns of that development, would ensure that the Master Plan would be consistent with this goal.
Goal 10-G-4 – Mitigate potential seismic hazards, including landsliding and liquefaction, during the design and construction of new development.	Yes	See discussion under Goal 10-G-2 above.
Goal 10-G-5 – Limit urban development in high-risk areas (such as landslide areas, flood zones, and areas subject to liquefaction.	Yes	The Master Plan area is located outside any sloped areas subject to landslides and outside the 100-year floodplain. While the Master Plan area is in a location identified by the General Plan as at risk for liquefaction, geotechnical analyses required of future development (see discussion under Goal 10-G-2 above) will ensure that this hazard is minimized and that the Master Plan will be consistent with this goal.
Goal 10-G-6 – Limit development on slopes greater than 30 percent (as delineated on Figure 10-1) to lower elevations, foothills, and knolls.	Yes	The Master Plan area does not include any slopes greater than 30 percent, ensuring compatibility with this goal.
Policy 10-P-1 – Ensure preparation of a soils report by a City-approved engineer or geologist in areas identified as having geological hazards in Figure 10-1, as part of development review.	Yes	See discussion under Goal 10-G-2 above.
Policy 10-P-2 – Restrict future development from occurring on slopes greater than 30 percent (as designated in Figure 10-1) over the 900-foot elevation contour, and on major and minor ridgelines (as delineated in Figure 4-2).	Yes	See discussion under Goal 10-G-6 above.
Policy 10-P-7 – As part of the development approval process, restrict grading to only those areas going into immediate construction as opposed to grading the entire site, unless necessary for slope repair or creek bed restoration. On large tracts of land, avoid having large areas bare and unprotected; units of workable size shall be graded one at a time.	Not Determined	The proposed Master Plan does not include specific details as to the grading requirements of development of any portion of the Master Plan area. However, it is expected that future development will be held to this requirement as a part of future development review to be undertaken by the City. As the Master Plan does not include a grading plan and as this analysis is programmatic in nature (see Section 4.0 of this

General Plan Policies	Consistent with General Plan	Analysis
		DEIR), the consistency of the Master Plan with this policy cannot be determined at this time.
Policy 10-P-8 – During development review, ensure that new development on unstable slopes (as designated in Figure 10-1) is designed to avoid potential soil creep and debris flow hazards. Avoid concentrating runoff within swales and gullies, particularly where cut-and-fill has occurred.	Yes	See discussion under Goal 10-G-2 above.
Policy 10-P-9 – Ensure geotechnical studies prior to development approval in geologic hazard areas, as shown in Figure 10-1. Contract comprehensive geologic and engineering studies of critical structures regardless of location.	Yes	See discussion under Goal 10-G-2 above.
Policy 10-P-15 – Develop standards for adequate setbacks from potentially active fault traces (as designated in Figure 10-2) for structures intended for human occupancy. Allow roads to be built over potentially active faults only where alternatives are impractical.	Yes	The Master Plan area does not encompass any part of a known fault, nor are any faults known to exist within 3 miles, nor are any Alquist-Priolo Fault Zones located within 5 miles. Therefore, development of the Master Plan area would be consistent with this policy.
Policy 10-P-16 – Ensure compliance with the current Uniform Building Code during development review. Explore programs that would build incentives to retrofit unreinforced masonry buildings.	Not Determined	The proposed Master Plan does not include detailed proposals for the development of any specific portion of the site, nor are any building permits under consideration by the City for the Master Plan area at this time. As with Policy 10-P-7 above, it is undetermined whether future development would be consistent with this policy. However, it is anticipated that future development review by the City would ensure consistency with this policy pursuant to the requirements for applications for development as set forth in the Pittsburg Municipal Code.

4.7.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The impact analysis provided below is based on the following standards listed in Appendix G of the State CEQA Guidelines. An impact is considered significant if the project would:

1) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

    a. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault.

    b. Strong seismic ground shaking.

c. Seismic-related ground failure, including liquefaction.

d. Landslides.

2) Result in substantial soil erosion or the loss of topsoil.

3) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.

4) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.

5) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

According to the Initial Study for the proposed Master Plan, released by the City concurrently with the Notice of Preparation on December 7, 2010, the proposed Master Plan would have less than significant impacts related to strong seismic ground shaking, landslides, soil erosion, loss of topsoil, and use of septic systems. Pursuant to State CEQA Guidelines Section 15128, no additional documentation of these impacts is required in the DEIR, nor is any included.

METHODOLOGY

Evaluation of potential geologic and soil impacts of the proposed Master Plan was based on review of available documentation, including the City of Pittsburg General Plan, General Plan EIR, and other documentation. Also reviewed were the Pittsburg/Bay Point BART Station Area Specific Plan EIR as well as documentation from the Association of Bay Area Government, the U.S. Department of Agriculture, and the U.S. Geological Survey.

PROJECT IMPACTS AND MITIGATION MEASURES

Ground Rupture Impacts

Impact 4.7.1 The Master Plan area does not contain any known fault lines, nor does it encompass any Alquist-Priolo Fault Zones. Therefore, the impacts of ground rupture on the project site are considered **less than significant.**

Ground rupture is generally considered most likely to occur along pre-existing faults. The existence of active fault-related features and historic ground rupture has been documented within the City of Pittsburg and the surrounding region (see **Table 4.7-3**). According to the Pittsburg General Plan, Figure 10-2, a number of fault branches exist south and southwest of the Master Plan area. However, none of these is located any closer than half a mile from the Master Plan area and all are listed as "minor" faults. The Alquist-Priolo Earthquake Fault Zoning Act establishes zones along known faults in which ground failure is a significant potential result of significant earthquakes along those faults. As discussed above, the nearest Alquist-Priolo fault zone is farther than 5 miles from the Master Plan area.

In consideration of the above facts, it is unlikely that fault rupture will occur on the Master Plan area, even in the event of a significant seismic event on any of the known faults in the vicinity of the Master Plan area. Furthermore, future development will be required to adhere to the seismic construction requirements of the California Building Standards Code, reducing the effect nearby fault rupture could have on the Master Plan area. Therefore, impacts related to surface rupture are expected to be **less than significant**.

Mitigation Measures

None required.

Liquefaction Impacts

Impact 4.7.2 The Master Plan area is located on flatland soils in an area of the City of Pittsburg not identified as having a high liquefaction potential. This impact is considered **less than significant**.

In general, sites with depths to groundwater greater than 40 to 50 feet are not susceptible to liquefaction during seismic events. However, depending on subsurface conditions much shallower groundwater depths do not necessarily indicate a high liquefaction potential. A specific geotechnical analysis of the Master Plan area has not been undertaken, thus the true depth to groundwater is unknown. Pittsburg is located along the Suisun Bay, which could provide hydrological pressure adequate to induce liquefaction in areas adjacent to the bay in the event of a significant seismic event. Soils found in the Master Plan area are described by the U.S. Department of Agriculture, Natural Resources Conservation Service as exhibiting groundwater at depths greater than 80 inches, the maximum depth reported by the Natural Resources Conservation Service. As discussed in the Existing Setting above, the Master Plan area lies outside the area identified in Figure 10-1 of the General Plan as having high liquefaction potential. As such, it is expected that liquefaction of soils under the Master Plan area during a significant seismic event is unlikely, resulting in a **less than significant** impact.

Mitigation Measures

None required.

Unstable Geologic Soils

Impact 4.7.3 Portions of the Master Plan area are in areas identified as containing unstable soils, which could cause impacts to structures and uses constructed in the Master Plan area as a result of the Master Plan and could result in lateral spreading, subsidence, collapse, or other effects both on- and off-site. This is a **potentially significant** impact.

While the General Plan identifies the Master Plan Area as having a minimum potential for expansion or contraction (City of Pittsburg, 2001a), all four soil types found in the Master Plan area (see **Table 4.7-1**) are classified by the U.S. Department of Agriculture as having "some limitations to construction". According to the Soil Survey (USDA 2010), limitations for on-site soils include soil shrink/swell and erosion.

In addition to the above information, the General Plan includes a depiction of moderately and generally unstable portions of the General Plan Planning Area (Figure 10-1). Two portions of the Master Plan area are identified as moderately unstable by the General Plan. One encompasses a portion of the easternmost BART parcel, the currently undeveloped portion of the BART property. The other portion indicated as having moderately unstable soils is located in the West

Coast Home Builders (WCHB) site slightly east of the intersection of Woodhill Drive and West Leland Road and extending approximately halfway into the Master Plan area in a narrow sliver.

Construction of uses described by the Master Plan, specifically those more intense uses such as the parking garage and multi-story flex uses described for the undeveloped BART parcel, have the potential to experience a variety of effects from construction on unstable soils. These effects include minor effects such as slightly buckling of paving/asphalt to major effects such as significant torsion of buildings and even complete building collapse if the soil failure is severe enough. Effects such as this would be **significant**.

Mitigation Measures

MM 4.7.3 Prior to approval of any building permits, grading permits, or other approval that would result in ground disturbance, a geotechnical analysis shall be prepared by a registered geologist or other professional approved by the City and presented to the City for approval. The required geotechnical analysis shall include consideration of all potential soil and seismic effects, including but not limited to liquefaction, soil stability, and soil shrink/swell potential and shall include recommended actions to reduce the effects of such conditions on the proposed construction. These recommendations shall be enacted to the satisfaction of the City in order to minimize these effects.

Because subsurface and soil conditions change only very slowly (on the order of millennia), a geotechnical analysis shall be prepared and submitted to the Engineering Division for approval for all proposed development proposed under the Master Plan.

Timing/Implementation: *Prior to approval of any grading permit, building permit, or other approval that would result in ground disturbance*

Enforcement/Monitoring: *City of Pittsburg Development Services Department*

Implementation of policy required by mitigation measure **MM 4.7.3** would ensure that any potential unstable soil is identified and that specific construction methods to minimize the effects of that soil are undertaken, ensuring that this impact is **less than significant**.

Expansive Soil

Impact 4.7.4 The proposed project is located on some clay soils, which may have the potential for expansion and contraction. Impacts associated with expansive soils are considered **potentially significant.**

Soil expansion, also known as shrink/swell, occurs as clay-type soils go through seasonal wetting and drying periods, causing the soil to swell when hydrated and shrink again when that extra moisture evaporates. According to the U.S. Department of Agriculture (2010), the soils found in the Master Plan area primarily impact construction through the shrink/swell potential of soils. Furthermore, the General Plan (2001) identifies portions of the Master Plan area that are moderately unstable (see Impact 4.7.3 above).

Soil expansion can have various effects on structures, especially when that potential is not anticipated during determination of the construction methods used. Potential effects of soil expansion are similar to those described in Impact 4.7.3 above. If construction in the Master Plan area were undertaken without consideration for expansion potential of on-site soils, the impact would be **significant**.

Mitigation Measures

Implementation of mitigation measure **MM 4.7.3** would ensure that any expansive soil conditions are identified in the Master Plan area prior to development and that specific steps are taken, including construction methods and building placement, to minimize the effects of expansive soils. Therefore, the ultimate impact of expansive soils on the Master Plan will be **less than significant**. No additional mitigation is required.

4.7.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

Impacts associated with geology and soils generally are site-specific (determined by a particular site's soil characteristics, topography, and proposed land uses) rather than cumulative in nature. Individual development projects in the region would be subject to, at a minimum, uniform site development and construction standards relative to seismic and other geologic conditions that are prevalent in the region. Impacts regarding surficial deposits, namely erosion and sediment deposition, can be cumulative in nature within a watershed. However, the proposed Master Plan is not expected to result in significant impacts in relations or erosion and sedimentation, as described in the Initial Study released by the City on December 7, 2010. Therefore, they are not considered further in this cumulative analysis. The reader is referred to Section 4.8, Hydrology and Water Quality, regarding cumulative water quality impacts from soil erosion.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Geology and Soils Impacts

Impact 4.7.5 Development described by the proposed Master Plan in addition to other proposed and approved project in the vicinity would not result in creation or exacerbation of any identified geological or soils impacts. This impact is considered **less than cumulatively considerable.**

Cumulative development of planned and proposed projects in the City of Pittsburg and the Bay Point area is not anticipated to result in cumulative issues associated with geology and soils. Risks associated with seismic events and soil conditions, such as liquefaction, would be site-specific and are not anticipated to increase on a cumulative level. The presence of a given development in the Master Plan area, or even the entire buildout of the Master Plan, would not directly impact adjacent development in regard to seismic and soils impacts. The particular design or manner of improvement to a given site does not have the potential to impact the soils or geologic conditions found on adjacent or nearby sites. Therefore, these types of impacts are not considered cumulative. As such, the cumulative impact is not considerable and the proposed Master Plan's contribution to that impact would be **less than cumulatively considerable**.

Mitigation Measures

None required.

REFERENCES

Association of Bay Area Governments (ABAG). 2007. Geographic Information Systems: Earthquake Shaking Potential. http://quake.abag.ca.gov/mapsba.html.

California Department of Conservation. 2009, February. Seismic Hazards Zonation Program – Seismic Hazard Zone Maps. http://www.conservation.ca.gov/cgs/shzp/Pages/ Accessed December 2010.

California Geological Survey. 2010. Alquist-Priolo Earthquake Fault Zone Maps. Provided online as a service of the California Department of Conservation. http://www.quake.ca.gov/gmaps/ap/ap_maps.htm Accessed December and January 2011. Walnut Creek Quadrangle and Vine Hill Quadrangle.

City of Pittsburg. 2001a. Draft Environmental Impact Report: City of Pittsburg General Plan.

City of Pittsburg. 2001b. Pittsburg 2020: A Vision for the 21st Century. City of Pittsburg General Plan. Includes Amendments through July 2010.

Contra Costa County, City of Pittsburg. 2001. Pittsburg/Bay Point BART Station Area Specific Plan Environmental Impact Report (Recirculated). Prepared in conjunction with Bay Area Rapid Transit. SCH 98022071.

United States Department of Agriculture (USDA), Natural Resources Conservation Service, Soil Survey Staff. 2010. Web Soil Survey. http://websoilsurvey.nrcs.usda.gov/.

United States Geological Survey (USGS). 2006. USGS Earthquake Hazards Program. http://neic.usgs.gov/neis/general/mercalli.html (accessed October 5, 2010).

4.8 Hydrology and Water Quality

This section discusses and analyzes surface hydrology, storm drainage, flooding, erosion/sedimentation, and stormwater quality impacts associated with the proposed project. Information presented in this section was based on a review of aerial photos of the site, research on the hydrology of the area, infrastructure plans, and review of the City of Pittsburg General Plan (2001).

4.8.1 SETTING

CLIMATE AND PRECIPITATION

The San Francisco Bay Area experiences a Mediterranean climate, characterized by mild winters and warm dry summers, due to its location near the ocean. During the summer, the dominant meteorological condition is a semi-permanent high-pressure cell over the northeastern Pacific Ocean. Areas of high pressure are formed where air sinks. High pressure tends to keeps storms away and causes predominant westerly winds.

Regional temperature inversions (i.e., a layer in the atmosphere in which temperature increases with altitude) are common in the late summer and fall. Annual rainfall in the Master Plan area is approximately 16 inches, with approximately 95 percent of the total annual rainfall occurring during the six-month period from October through April. Rainfall results almost exclusively from rotating systems that form in the northern Pacific Ocean during winter, which release rain as they approach land. Heavy rainfall typically occurs from December through February with the greatest amount (3.5 inches) occurring in January (City of Pittsburg 2001).

SURFACE HYDROLOGY

The Master Plan area is located within the Lawlor Creek watershed. The majority of the watershed south of the community of Bay Point is undeveloped, although some residential development has been constructed south of State Route (SR) 4. Most runoff is conveyed by natural channels. Developed areas convey runoff through storm drains and culverts under SR 4. Minor watersheds are located west of Lawlor Creek, between Lawlor and Kirker creeks, and adjacent to the northeastern boundary of the Kirker Creek watershed north of State Route 4 (see **Figure 4.8-1**). Local minor watersheds are drained by small natural channels with no official names (City of Pittsburg 2004).

Stormwater falling on the undeveloped West Coast Home Builders (WCHB) site is generally absorbed into the ground, as this area is unimproved and contains no impervious surfaces other than curbs along West Leland Road and a small portion of sidewalk located at the intersection of West Leland Road and Woodhill Drive. If the ground becomes saturated, excess runoff travels generally northward toward an existing open culvert that travels along the northern boundary of the site westward to an underground drain leading under SR 4 to the north. The same is generally true for the undeveloped Bay Area Rapid Transit (BART) parcel, except the culvert along the northern boundary of that parcel leads westward and ties into the BART stormwater collection system. On the developed BART parcels, a network of storm drains and culverts has been installed that conveys water to the existing 0.8-acre stormwater detention basin. The function of this basin is two-fold—preventing flows to the north from exceeding the capacity of the existing system and pre-treating stormwater by means of settling and passive filtering through soil and plants that line the bottom of the basin.

Contra Costa County has developed a Drainage Area (DA) Boundary Map that shows the legally described area for the Drainage Area parcels within that boundary. These parcels are noted in the assessor's parcel database so that the County Flood Control and Water

Conservation District can identify which parcels are legally in the Drainage Area (Contra Costa County Flood Control and Water Conservation District 2008). The Master Plan area is located in Drainage Area 48B and is served by Line B within this drainage area. From West Leland Road west of the BART station (the eastern half of the Master Plan area), stormwater runoff is diverted to a 42-inch storm drain that carries runoff north and under SR 4. From West Leland Road in the vicinity of the BART property, stormwater is diverted to an open channel that conveys runoff northward to a 36-inch storm drain under SR 4. Stormwater runoff from the Oak Hills Shopping Center located along Bailey Road to the east of the Master Plan area is transported north to drainage facilities located along the south side of SR 4 that carry the runoff west to a culvert under SR 4. This culvert is located immediately west of the end of the SR 4/Bailey Road interchange on- and off-ramps (City of Pittsburg 2001). Storm drainage infrastructure is also located south of the Master Plan area within West Leland Road and in the existing subdivision project to the south (see **Figure 4.8-2**). Flows from the upper watershed area south of SR 4 are constricted by the capacity of the existing culverts under SR 4.

North of SR 4, stormwater runoff flows northward via two main routes. The first route conveys runoff from the Oak Hills Shopping Center north under SR 4 to a small open channel between SR 4 and Canal Road. From this point, stormwater is diverted north under Canal Road to an open drainage channel. This open drainage channel outflows via a 48-inch storm drain and connects to a 72-inch storm drain north of Mims Avenue. The second drainage system north of SR 4 combines the two storm drainage systems located south of SR 4 and west of the Oak Hills Shopping Center into one drainage immediately north of Canal Road. From Canal Road, stormwater is conveyed through a series of culverts and open channels northward to the 72-inch storm drain north of Mims Avenue (City of Pittsburg 2001).

Flooding

Some sections of Lawlor Creek located downstream of the Master Plan area generally flood during 100-year storm events, as indicated on the Flood Insurance Rate Map dated 1987 issued by the Federal Emergency Management Agency (FEMA) (City of Pittsburg 2001). The 100-year flood zone associated with Lawlor Creek east of the SR 4/Bailey Road interchange and north of State Route 4 extends from Canal Road north along the length of the stream to the Suisun Bay. The flood zone is primarily restricted to the stream channel (City of Pittsburg 2001). As shown in the General Plan, the Master Plan area is not located in a 100-year floodplain.

Groundwater

The Master Plan area is within the Pittsburg Plain groundwater basin, a 30-square-mile elongated basin that aligns east-west along, and parallel to, SR 4. Groundwater in the aquifer flows north and recharges the Sacramento/San Joaquin River system. Within upland areas of the Pittsburg Plain, groundwater has been documented to be between 18 to 28 feet. In low-lying areas near the Suisun Bay and in ravines and creek channels, shallow groundwater may be encountered (City of Pittsburg 2001), but the elevation of the Master Plan area is contraindicative for groundwater shallower than 80 inches (USDA 2010).

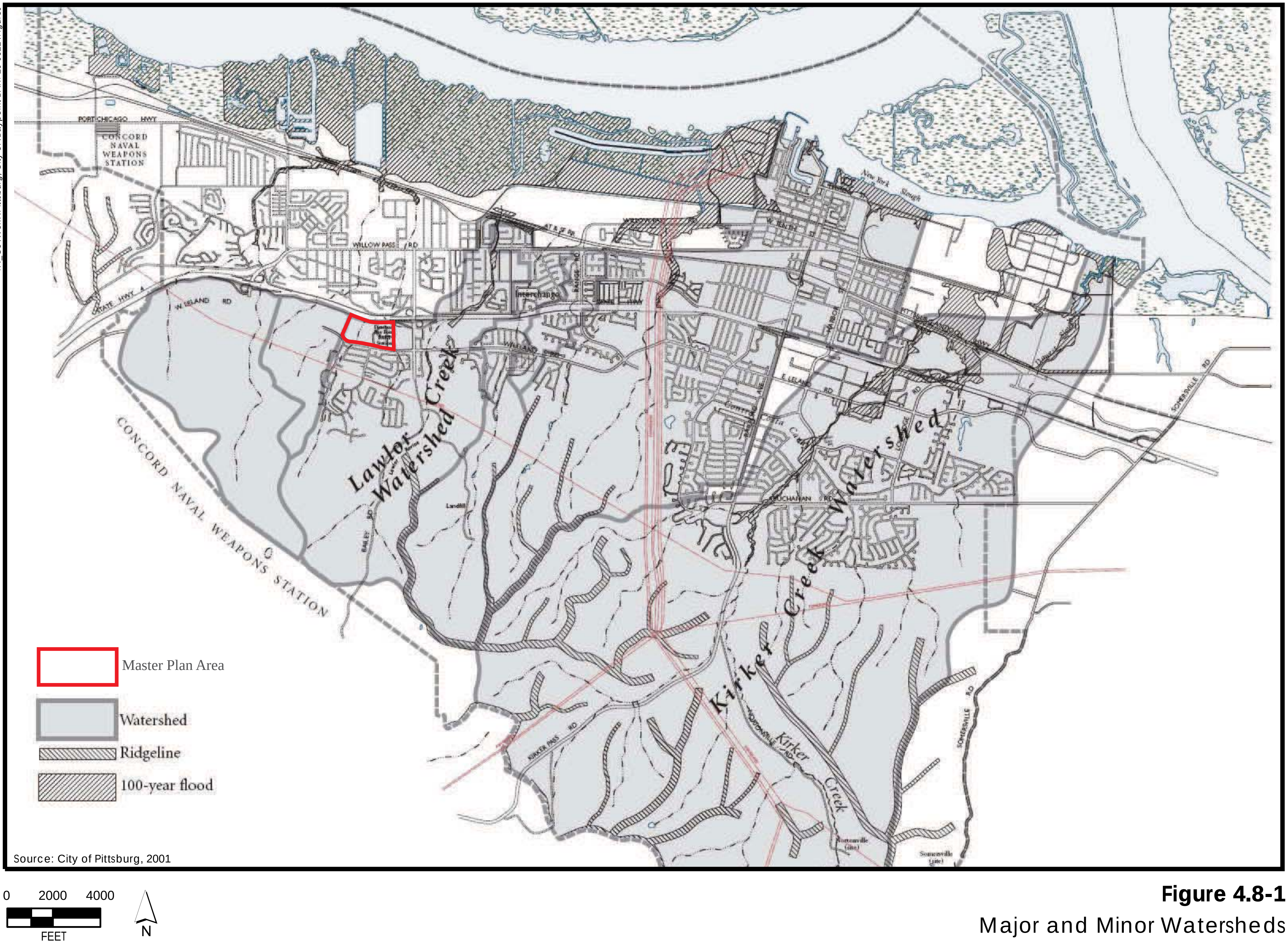
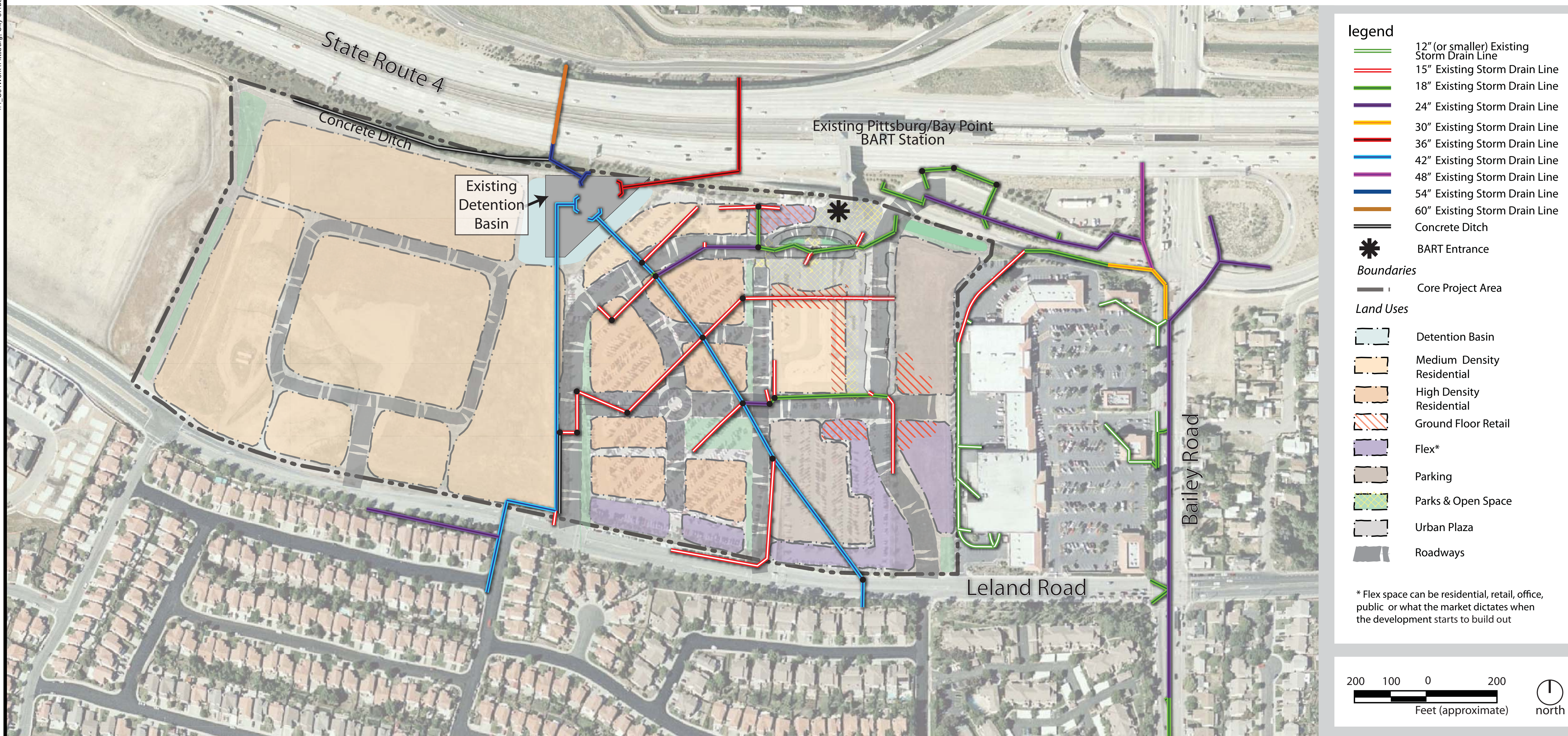


Figure 4.8-1

Major and Minor Watersheds

PMC®



Source: Mark Thomas & Company, Inc. 2010

Figure 4.8-2

Infrastructure Plan - Existing Storm Drains

PMC

Between the 1930s and the 1950s, intense groundwater pumping resulted in overdraft and intrusion of saline water into the aquifer. Widespread use of surface water from the Contra Costa Canal alleviated these problems. The City of Pittsburg supplements its water supply with groundwater from the Bodega Court and Rossmoor wells located near the geographic center of the city at Dover Way and Frontage Road (City of Pittsburg 2009). These wells are located more than 3 miles from the Master Plan area.

WATER QUALITY

Urban runoff represents a significant component of the existing wastewater stream. Pollutants may include concentrations of oxygen-demanding substances, nutrients, and pathogenic microorganisms. Sources of urban runoff pollutants originate from motor vehicles, buildup of oil and grease on impervious surfaces, landscaping and maintenance activities, construction and industrial activities, and illegal or accidental connections from non-stormwater sources such as spills, and dumping. Heavy metals and organic and inorganic compounds deposited from the atmosphere may also be present in runoff (City of Pittsburg 2001).

Potentially Affected Receiving Waters

Suisun Bay

Suisun Bay is the first of the water bodies that form the San Francisco Bay Estuary–Delta system. The Delta receives flow from the Sacramento River, the San Joaquin River, and various tributaries to these rivers. The drainage areas that contribute flows to the rivers comprise approximately 37 percent of the land area of the state. Much of the land area is devoted to agricultural and forestry land uses. Major urban centers also contribute discharges into the Sacramento River and San Joaquin River. Pollutants generated by agricultural activities and urban runoff reach the San Francisco Bay through discharge from wastewater treatment plants, stormwater runoff, agricultural drainage, and disposal of dredged materials. Salinity in the Suisun Bay is generally lower than in downstream waters such as the San Pablo Bay, because of the freshwater inflow from the rivers (City of Pittsburg 2001).

Suisun Bay is listed by the San Francisco Bay Regional Water Quality Control Board as having limited water quality, as required by the Clean Water Act, Section 303(d) (California Water Resources Control Board 2002). Suisun Bay is listed as having water quality issues related to the following compounds and conditions:

- Chlordane;
- Dichlorodiphenyltrichloroethane (DDT);
- Diazinon;
- Dieldrin;
- Dioxin Compounds;
- Exotic Species;
- Furan Compounds;
- Mercury;
- Nickel;
- PCBs (both standard and dioxin-like); and
- Selenium.

Suisun Bay is listed as containing 27,498 acres of polluted water surface.

Lawlor Creek

As previously noted, the Master Plan area is located within the Lawlor Creek watershed. The County requires all developments tributary to Lawlor Creek to mitigate their adverse drainage impacts on the natural creek (City of Pittsburg 2001). Lawlor creek is not listed by the California Water Resources Control Board as having limited water quality (2002).

4.8.2 REGULATORY FRAMEWORK

FEDERAL AND STATE

Clean Water Act (CWA)

The Clean Water Act (CWA), initially passed in 1972, regulates the discharge of pollutants into watersheds throughout the nation. The State Water Resource Control Board (SWRCB) is responsible for implementing the Clean Water Act in California and issues National Pollutant Discharge Elimination System (NPDES) permits to cities and counties through Regional Water Quality Control Boards (RWQCB). The project site is located in a portion of the state that is regulated by the San Francisco Bay Regional Water Quality Control Board.

Part of the CWA provides for the NPDES, in which discharges into navigable waters from point and non-point sources are prohibited except in compliance with specified requirements and authorizations. Municipal and industrial facilities are required to obtain an NPDES permit that specifies allowable limits for pollutant levels in their effluent based on available wastewater treatment technologies. In addition, under NPDES requirements, dischargers in any location whose projects disturb one or more acres of soil, or whose projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the statewide General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 2009-0009-DWQ as amended by 2010-0014-DWQ). Construction activity subject to this permit includes clearing, grading, and disturbances to the ground such as stockpiling or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP should contain a site map(s) which shows the construction site perimeter, existing and proposed buildings, lots, roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the project. The SWPPP must list best management practices the discharger will use to protect stormwater runoff and the placement of those BMPs.

San Francisco Bay Basin Water Quality Control Plan

The San Francisco Bay RWQCB regulates surface water and groundwater quality in the San Francisco Bay through its San Francisco Bay Water Quality Control Plan (Basin Plan). The Basin Plan is the master policy, legal, and technical document for water quality regulation in the San Francisco Bay region. The Basin Plan specifies beneficial uses of receiving waters, water quality objectives imposed to protect the designated beneficial uses, and strategies and schedules for achieving water quality objectives. The RWQCB also issues permits of waste discharges and implements monitoring programs of pollutant effects (City of Pittsburg 2001).

State policy for water quality control in California is directed toward achieving the highest water quality consistent with maximum benefit to the people of the state. Therefore, all water resources must be protected from pollution and nuisance that may occur as a result of waste discharges. Beneficial uses of surface waters, groundwaters, marshes, and mud flats serve as a basis for establishing water quality standards and discharge prohibitions to attain this goal. Beneficial uses that have been identified for the Suisun Bay include:

- Water contact and non-contact water recreation
- Navigation
- Ocean, commercial, and sport fishing
- Wildlife habitat
- Estuarine habitat
- Fish spawning and migration
- Industrial service supply
- Preservation of rare and endangered species (City of Pittsburg 2001)

LOCAL

Contra Costa Clean Water Program

In October 2009, the San Francisco Bay Regional Water Quality Control Board adopted a Municipal Regional Permit (MRP) governing discharges from municipal storm drains operated by 76 local government entities, including those in western and central Contra Costa County. Eastern Contra Costa cities are currently implementing the MRP requirements. Provision C.3 of the MRP included specific requirements for development projects and was in effect from 2005 until 2009. Additional requirements will be phased in during the five-year term of the MRP (Contra Costa Clean Water Program 2010).

The C.3 requirements are separate from, and in addition to, requirements for erosion and sediment control and for pollution prevention measures during construction. Project site designs must minimize the area of new roofs and paving. Where feasible, pervious surfaces should be used instead of paving so that runoff can infiltrate to the underlying soil. Runoff from impervious areas must be captured and treated. The MRP specifies the sizes and types of facilities that may be used. In addition, project applicants must prepare plans and execute agreements to ensure the stormwater treatment and flow-control facilities are maintained in perpetuity (Contra Costa Clean Water Program 2010). Contra Costa municipalities have prepared a Stormwater C.3 Guidebook to assist applicants with stormwater requirements, reviews, and submittals.

Contra Costa County Flood Control and Water Conservation District

Developers are required to pay fees for drainage infrastructure in the City of Pittsburg. Developers must verify the adequacy of downstream storm drain facilities to convey runoff from proposed development. Portions of the Master Plan area lie within Drainage Area 48B as designated by the Contra Costa County Flood Control and Water Conservation District. Drainage Area 48B has a drainage fee based on $0.42 per square foot for newly created impervious surface area (Contra Costa County Flood Control and Water Conservation District 2007). The County requires payment of fees prior to the filing of final maps and parcel maps or the issuance of building permits, whichever the case may be within the individual drainage areas.

City of Pittsburg General Plan

The City of Pittsburg 2020 General Plan Health and Safety Element includes goals and policies related to surface hydrology, storm drainage, flooding, erosion/sedimentation, and stormwater quality. **Table 4.8-1** analyzes the project's consistency with applicable City of Pittsburg General Plan policies. While this DEIR analyzes the project's consistency with the City of Pittsburg General Plan pursuant to CEQA Section 15125(d), the Pittsburg City Council has the responsibility for ultimately determining the proposed Master Plan's consistency with the General Plan. Environmental impacts associated with inconsistency with General Plan policies are addressed under the appropriate impact discussion sections of this DEIR.

TABLE 4.8-1
PROJECT CONSISTENCY WITH APPLICABLE GENERAL PLAN HEALTH AND SAFETY POLICIES

General Plan Policies	Consistent with General Plan	Analysis
Resource Conservation		
Goal 9-G-4 – Minimize the runoff and erosion caused by earth movement by requiring development to use best construction management practices.	Yes	Future grading on the project site will be required to prepare a Stormwater Pollution Prevention Plan, which will include construction BMPs.
Goal 9-G-5 – Preserve and enhance Pittsbrug's creeks fro their value in providing visual amenity, drainage capacity, and habitat value.	Yes	The Master Plan Area does not include any creeks.
Goal 9-G-6 – Preserve and protect the Contra Costa Canal from storm drainage and runoff contaminating the City's municipal water supply.	Yes	The Master Plan Area would not drain into the canal during construction or operation of the Master Plan. Stormwater infrastructure has been designed so that flows off-site will be the same as they are currently.
Policy 9-P-21 - As part of project review and CEQA documentation, require an assessment of downstream drainage (creeks and channels) and City storm-water facilities impacted by potential project runoff.	Yes	The Master Plan and this DEIR include a stormwater analysis presented by Mark Thomas & Company, Inc, which assesses downstream drainage and runoff (see **Appendix F**).
Policy 9-P-23 - Require new urban development to use Best Management Practices to minimize creek bank instability, runoff of construction sediment, and flooding.	Yes	See Goal 9-G-4 above.
Flooding		
Goal 10-G-7 – Locate development outside flood-prone areas unless mitigation of flood risk is assured.	Yes	The Master Plan site is located outside of the FEMA Flood Insurance Rate Map 100-year floodplain (refer to **Figure 4.8-3**).

General Plan Policies	Consistent with General Plan	Analysis
Goal 10-G-8 – Ensure that new development mitigates impacts to the City's storm drainage capacity from storm water runoff in excess of runoff occurring from the property in its undeveloped state.	Yes	Development within the Master Plan area would be required to comply with the provisions regarding payment of fees to mitigate impacts to drainage systems. Furthermore, detention basin expansion is included in the proposed Master Plan for the purpose of ensuring that runoff does not exceed system capacity.
Policy 10-P-18 – Evaluate storm drainage needs for each development project in the context of demand and capacity when the drainage area is fully developed. Ensure drainage improvements or other mitigation of the project's impacts on the storm drainage system appropriate to the project's share of the cumulative effect.	Yes	As part of the preparation of the Master Plan, Mark Thomas & Company, Inc. prepared a detailed hydrological analysis and subsequently planned on-site stormwater collection, retention, and passive treatment facilities to handle all on-site runoff. Save for connection to existing storm drain networks immediately adjacent to the site, all infrastructure would be constructed within the Master Plan area.
Policy 10-P-19 – Assure through the Master Drainage Plan and development ordinances that proposed new development adequately provides for on-site and downstream mitigation of potential flood hazards.	Yes	The proposed Master Plan is not located in a floodplain, nor would it introduce any features that could cause flooding given that on-site stormwater collection, retention, and passive treatment facilities would handle all on-site runoff.
Policy 10-P-26 – Reduce the risk of localized and downstream flooding and runoff through the use of high infiltration measures, including the maximization of permeable landscape.	Yes	See discussion under Policy 10-P-18 above.
Geology and Seismicity		
Goal 10-G-3 – Minimize the potential for soil erosion by wind and stormwater runoff.	Yes	Potential erosion impacts of the proposed Master Plan were found by the Initial Study (issued concurrently with the Notice of Preparation) to be less than significant.

4.8.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The impact analysis provided below is based on the following State CEQA Guidelines Appendix G thresholds of significance. An impact is considered significant if the project would:

1) Violate any water quality standards or waste discharge requirements.

2) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).

3) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner resulting in substantial erosion or siltation on- or off-site.

4) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner would result in flooding on- or off-site.

5) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.

6) Otherwise substantially degrade water quality.

7) Place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

8) Place within a 100-year flood hazard area structures which would impede or redirect flood flows.

9) Expose people or property to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.

10) Inundation by seiche, tsunami, or mudflow.

According to the Initial Study prepared by the City and issued along with the Notice of Preparation on December 7, 2010, the proposed Master Plan is not anticipated to have any potentially significant impacts related to flooding or inundation by seiche, tsunami, or mudflow. The Master Plan area is not located in any flood zone or area, nor is it located in the inundation zone of any dam. Also, the Master Plan area is located a sufficient distance from the Suisun Bay to preclude any impacts from seiche or tsunami. Lastly, the presence of a substantial amount of urban development south (uphill) of the Master Plan area precludes impacts from mudflow. Pursuant to State CEQA Guidelines, Section 15128, these impacts are not discussed further in this DEIR.

METHODOLOGY

In order to quantify the hydrological impacts of the proposed Master Plan, Mark Thomas & Company, Inc. prepared a detailed hydrological analysis of the project (see **Appendix F**). The findings of this analysis were used in formulating the Master Plan itself as well as in developing the analysis presented below. Mark Thomas & Company's conclusions were based on assumed development characteristics in the Master Plan as well as the development assumptions included in this DEIR (Section 4.0, Assumptions). Using the Bay Area Hydrology Model[1] and the physical characteristics of the Master Plan, as well as the characteristics, capacity, and location of existing stormwater infrastructure in the city and especially in the vicinity of the Master Plan area, Mark Thomas & Company developed flow quantities expected of the Master Plan area at

[1] The Bay Area Hydrology Model (BAHM) is a tool for analyzing the potential hydrograph modification effects of land development projects and sizing structural solutions to mitigate the increased stormwater runoff from these projects. This software was developed for use in three counties in the San Francisco Bay Area: Alameda, San Mateo and Santa Clara. However, the model allows manual input of variables for use in other counties such as Contra Costa and is used by many agencies in Contra Costa County for modeling of stormwater effects.

buildout under a variety of storm conditions. Mark Thomas & Company also determined the required size of the detention basin needed to contain that flow and prevent exceeding the system capacity downstream of the Master Plan area. The data presented by Mark Thomas & Company and used in developing the stormwater system of the Master Plan is presented in **Appendix F**.

As with other topic areas in this DEIR, analysis of hydrological impacts included review of existing documentation and plans in the project vicinity, including the Pittsburg General Plan and the Pittsburg/Bay Point BART Station Area Specific Plan and EIR.

IMPACTS AND MITIGATION MEASURES

Violate Water Quality Standards or Discharge Requirements (Short-Term Construction and Long-Term Operation)

Impact 4.8.1 Construction following implementation of the proposed Master Plan would not result in discharge of pollutants and soils during construction, nor increased surface runoff and release of contaminants during operation. Therefore, impacts associated with violation of water quality standards or discharge requirements are considered **less than significant.**

Short-Term Construction

The greatest potential impact to water quality from the proposed Master Plan may exist during construction when earthmoving and vegetation removal occurs. The Master Plan area would be subject to grading and new construction on the entire site, approximately 26.85 acres of which is undeveloped. While no soil import or export is expected to be required due to the generally flat topography of the site, excavations and grading would be necessary to construct building pads, roadways, and utilities associated with the Master Plan. In addition to soil disturbance, the presence of heavy equipment on the Master Plan area presents the opportunity for spills of oil and fuel necessary for the maintenance and operation of that equipment. Other materials such as paint and solvents used during construction could also accidentally be discharged to surface waters. All of these construction activities could lead to release of pollutants and/or increased soil erosion transport to Lawlor Creek and ultimately to the Suisun Bay.

The State Water Resources Control Board is responsible for implementing the Clean Water Act and has issued a statewide General Permit (Construction General Permit, 2009-0009-DWQ as amended by 2010-0014-DWQ) for construction activities within the state. The Construction General Permit (CGP) is implemented and enforced by the RWQCBs. The CGP applies to construction activities that disturb 1 acre or more and requires the preparation and implementation of a stormwater pollution prevention plan (SWPPP) that identifies best management practices to minimize pollutants from discharging from the construction site to the maximum extent practicable. The BMPs that must be implemented can be categorized into two major categories: (1) erosion and sediment control BMPs and (2) non-stormwater management and materials management BMPs. The CGP prohibits the discharge of materials other than stormwater and authorized non-stormwater discharges (such as irrigation and pipe flushing and testing).

All future development in the Master Plan area would be required to prepare and implement a SWPPP, which would be reviewed and approved by the City and other appropriate agencies, such as the RWQCB, prior to issuance of a grading or building permit. In addition, each individual development project would need to comply with the Contra Costa County Clean

Water Program requirements and would be subject to review by the City to ensure compliance with the applicable NPDES permit requirements.

The requirements of permits required prior to development of the site, especially the BMPs required of an NPDES permit, would ensure that water quality impacts from construction of the project would be **less than significant**.

Long-Term Operations

Development following approval of the Master Plan would increase the amount of impervious surfaces on the site through the introduction of roadways, driveways, residential and mixed-use structures, sidewalks, pedestrian/bicycle pathways, and parking lots. In addition, lawn and landscape areas would be introduced to the site. All of these features would present the potential for generation of stormwater pollutants including hydrocarbons, grease, oil, fertilizers, and pesticides typically utilized by such development and the people that live and work there. The quality of stormwater runoff from the non-point source pollutants could degrade water quality in the Suisun Bay and Lawlor Creek if they were discharged off-site by stormwaters. The County requires all developments tributary to Lawlor Creek to mitigate adverse drainage impacts on the natural creek (City of Pittsburg 2001).

The City of Pittsburg participates in the NPDES process and ensures compliance with the County's Lawlor Creek requirements (previous paragraph) by requiring that best management practices (BMPs) be implemented in the design of a project's storm drainage system to reduce or eliminate stormwater pollution as a Condition of Approval for any ground-disturbing activity (City of Pittsburg 2001). The RWQCB will require complete pre-and post-construction BMPs for development of the entire Master Plan area. Pre-construction requirements would be consistent with the requirements of the NPDES permit. A post-construction BMP plan would have to be developed and incorporated into the site development plan, likely requiring pretreatment water quality basins (City of Pittsburg 2001). A water quality treatment plan for the BMPs would also be required. These BMPs are to be implemented during project construction and included in long-term operation and maintenance of facility infrastructure.

In addition to the BMPs and permit requirements discussed above, the proposed Master Plan would include an expanded stormwater detention basin into which all operational stormwater runoff that does not infiltrate into landscaped and other pervious areas would flow. By its design, the stormwater detention basin would not only retain runoff at a rate suitable to prevent exceedance of system capacity downstream of the Master Plan area, it would reduce the presence of particulate matter and other pollutants in the stormwater through a combination of settling and filtration as water seeps through the soil and plants that line the bottom of the detention basin.

Because projects in the Master Plan area would be subject to compliance with the permit conditions set forth by the CGP, NPDES permit, and Contra Costa County Clean Water Program, and because the Master Plan includes a detention basin that would have beneficial effects on stormwater quality, the Master Plan would not be expected to violate water quality standards or discharge requirements during construction or operation. Compliance with required permits and programs would ensure potential violations of water quality standards or discharge requirements would be reduced to **less than significant**.

Mitigation Measures

None required.

Impacts to Groundwater Supplies and Recharge

Impact 4.8.2 The proposed Master Plan includes a detention basin, which would allow recharge of groundwater. Water supply for the City of Pittsburg is made up primarily of surface water. Therefore, impacts to groundwater supplies and recharge are considered **less than significant**.

The City of Pittsburg extracts groundwater to supplement its surface water supply (see Section 4.11, Public Services and Utilities). However, these groundwater wells make up less than 15 percent of all water supplied to customers in the city. Additionally, although the increased impervious surfaces associated with future construction of the Master Plan area would reduce the amount of stormwater infiltrating the soil and entering the groundwater table will be reduced by the Master Plan, these wells are located far enough away from the project site that any direct impact to groundwater recharge at those well points is unlikely. Therefore, the project is not anticipated to substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table, and this impact is considered **less than significant**. (Note: Environmental effects of water provision to the Master Plan are discussed further in Section 4.11, Public Services and Utilities.)

Mitigation Measures

None required.

Alter Drainage Pattern/Increase Runoff Volumes

Impact 4.8.3 Development associated with the Master Plan would increase local runoff on the project site but would not lead to flows that could exceed the capacities of existing storm sewer facilities. This impact is considered **less than significant.**

Almost half of the Master Plan area is improved, with some structures and a large area of paving and asphalt used for parking at the BART station and for bus pick-up areas. However, alteration of the existing drainage pattern of the Master Plan area would occur in association with development of the Master Plan. Increased volumes of runoff are anticipated as a result of development of the 23.4-acre unimproved western portion of the site and the 3.45-acre parcel on the east side of the BART station parking lot, through the introduction of paved surfaces and structures. In order to understand the hydrological effects of development in the Master Plan area, as well as to adequately plan for the additional stormwater flow expected from the installation of so much impermeable surface (buildings, hardscape, roadways, etc.), Mark Thomas & Company undertook modeling of future flows based on the known conditions of the Master Plan area and the development assumptions included in Section 4.0 of this DEIR (as well as certain design aspects of the Master Plan itself).

For each of the phases of the Master Plan, Mark Thomas & Company developed a likely drainage scenario taking into account where each area would be likely to drain (often toward roadways) as well as the drainage coefficient of that area—a factor of the amount of pervious surfaces to be located in that portion of the project. Infiltration is assumed to be higher for parks and landscaping and almost zero for parking garages and structures. While exact structures are not designed nor mandated by the Master Plan, the area of likely structures and their design can be inferred from the requirements of the Master Plan. By using the results of the hydrological model, Mark Thomas & Company was able to determine the amount of flow that would be directed into the on-site detention basin under a range of meteorological conditions. In all conditions and expected storm events, the system is expected to retain 100 percent of stormwater flows from the project site. As the detention basin would retain storm flows to a degree adequate to prevent overtopping the adjacent stormwater system as it leads to the Suisun Bay, no off-site infrastructure is required.

While the proposed Master Plan would be expected to alter on-site drainage patterns and increase the amount of runoff generated by the Master Plan area, these additional flows have been considered in the design of on-site stormwater facilities; no off-site erosion or flooding impacts are expected. The physical impacts of installing the on-site stormwater system have been addressed in aggregate in the appropriate sections of this DEIR (Sections 4.1 through 4.13). As such, the proposed Master Plan would have a **less than significant** impact.

Mitigation Measures

None required.

4.8.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The cumulative setting for hydrology and water quality is the Lawlor Creek watershed and associated natural drainages and infrastructure that convey flows from this watershed.

CUMULATIVE IMPACTS

Cumulative Impacts to Hydrology and Water Quality

Impact 4.8.4 The proposed project, in combination with existing, approved, proposed, and reasonably foreseeable development, would not contribute to the cumulative effects of degradation of regional water quality, changes to runoff patterns, or the potential for increased flooding. This would be a **less than cumulatively considerable** impact.

Implementation of the proposed Master Plan has the potential to increase water pollutant loads during both construction and operation. The project would increase the amount of impervious surfaces to the site and watershed, which would result in increased rates and amounts of runoff on the project site. The City of Pittsburg and Contra Costa County's Department of Public Works and Flood Control and Water Conservation District oversee drainage infrastructure. Drainage and water quality impacts are typically reduced on a project-by-project basis and are addressed either through regulations and standards that must be adhered to as part of the development process or through design features incorporated into each development project.

As discussed in the analysis above, the proposed Master Plan would be subject to several levels of existing permit requirements concerning construction and operational water quality impacts. Furthermore, internal drainage infrastructure has been designed such that flows leaving the site will remain unchanged from the existing condition and will not exceed the capacity of the system. The on-site detention basin will also filter any contaminants that enter the stormwater system via land uses and roadways in the Master Plan area. As a result, the project's contribution to cumulative hydrology and water quality impacts would be considered **less than cumulatively considerable**.

Mitigation Measures

None required.

REFERENCES

California Water Resources Control Board. 2002, July. 2002 CWA Section 303(d) List of Water Quality Limited Segment, San Francisco Bay Regional Water Quality Control Board. Approved by U.S. EPA on July 2003.

City of Pittsburg. 2001. Pittsburg 2020: A Vision for the 21st Century. City of Pittsburg General Plan. Includes Amendments through July 2010.

———. 2004. Draft Environmental Impact Report for the Vista Del Mar Project. SCH No. 2004012097.

———. 2009. Railroad Avenue Station Area Specific Plan Draft Environmental Impact Report.

Contra Costa Clean Water Program. 2010. New Development/C.3. http://www.cccleanwater.org/c3.html (accessed September 29, 2010).

Contra Costa County. 2009. DA [Drainage Area] Maps. http://www.co.contra-costa.ca.us/index.aspx?NID=1443 (accessed August 27, 2009).

Contra Costa County and City of Pittsburg. 2001. Pittsburg/Bay Point BART Station Area Specific Plan Environmental Impact Report (Recirculated). Prepared in conjunction with Bay Area Rapid Transit. SCH 98022071.

Contra Costa County Flood Control and Water Conservation District. 2007. Drainage Fee Schedule Updated February 19, 2007. http://www.co.contra-costa.ca.us/DocumentView.aspx?DID=1520 (accessed August 27, 2009).

———. 2008. Contra Costa County Formed Drainage Areas. http://www.co.contra-costa.ca.us/DocumentView.aspx ?DID=1788 (accessed October 8, 2010).

Contra Costa Water District (CCWD). 2005. Urban Water Management Plan.

United States Department of Agriculture (USDA), 2010. Natural Resources Conservation Service, Soil Survey Staff. Web Soil Survey. http://websoilsurvey.nrcs.usda.gov/.

4.9 Biological and Natural Resources

This section describes the natural resources present in the Master Plan area and includes a discussion of the special-status species and sensitive habitats potentially occurring in the area. This section analyzes impacts that could occur to biological resources due to project implementation and appropriate mitigation measures to reduce or avoid those impacts. The analysis of biological resources presented in this section is based on a review of the most current project description and a biological survey (PMC, 2009), as well as maps and available literature from federal, state, and local agencies. Related discussions are found in Section 4.8, Hydrology and Water Quality, and Section 4.1, Land Use and Planning.

4.9.1 EXISTING SETTING

MASTER PLAN AREA AND VICINITY

The Master Plan area consists of approximately 50.6 acres and is located within the city limits of Pittsburg in Contra Costa County, California. The site is surrounded on three sides by urban development and includes the existing Bay Area Rapid Transit (BART) station and parking facilities.

The Master Plan area is located within the Central California Coast section, Suisun Hills and Valleys subsection (Miles and Goudey 1997). The region is an area of low hills north and south of the Carquinez Strait and includes valleys between the hills. The region also contains plains at the west end of the Sacramento-San Joaquin River Delta. The climate is hot and subhumid. It is very windy on hills adjacent to and north of the Carquinez Strait (Miles and Goudey 1997). The Master Plan area consists of mostly annual grassland and ruderal habitat with relatively flat topography, with a steep incline along the western border of the area. The predominant natural plant communities in the region are grasslands and blue oak (*Quercus douglasii*) woodland (Miles and Goudey 1997). All but the larger streams in the region are dry through most of the summer (Miles and Goudey 1997). The Master Plan area is located within the Lawlor Creek watershed, part of the larger Suisun Bay watershed of the San Francisco Bay Hydrologic Unit.

The climate of the region follows a predominantly Mediterranean pattern, with warm dry summers and cool wet winters. The mean annual precipitation is about 15 to 20 inches. Mean annual temperature is about 56° to 60° F. The mean freeze-free period is about 250 to 275 days (Miles and Goudey 1997).

Local Environment

Vegetative Communities and Habitat Types

Vegetative communities are found where groups of plant species occur together in the same geographic area. Specific wildlife habitats are created by these vegetative communities. Wildlife habitats provide cover, food, and water, which is necessary in order to support a particular wildlife species or groups of species. Changes in these habitats, both significant and minor, can impact a species' abundance, distribution, and diversity as well as interactions between different species. The vegetative communities or habitat types found within the Mater Plan area include annual grassland, ruderal, detention basin (fresh emergent wetland), and urban or developed land. These vegetative communities are depicted on Figure 4.9-1.

The following discussion describes the vegetative communities listed in Table 4.9-1. Included in the discussion of each vegetative community is a description of the community or habitat and any pertinent information on the plant and wildlife species found within the community, where applicable.

TABLE 4.9-1
VEGETATIVE COMMUNITY IDENTIFIED IN THE MASTER PLAN AREA

Cover Types	Area (Acres)	Percentage of Master Plan Area
Annual Grasslands	21.3	42%
Ruderal	23.8	47%
Detention Basin (Freshwater Emergent Wetland)	1.0	2%
Urban (Developed)	4.0	8%
Total	50.6	100%

Source: PMC 2009 (communities identified from aerial photography and confirmed during a site visit on April 28, 2009).
Notes: Totals may not equal due to rounding.

Annual Grasslands

Annual grassland habitat consists of open grasslands composed primarily of introduced annual grass and forbs. Annual grassland generally occurs on flat plains to gently rolling foothills throughout the Central Valley, in the coastal mountain ranges to Mendocino County, and in scattered locations in the southern portion of the state (Kie 2005). This widespread vegetation type is found on the undeveloped eastern portion of the Master Plan area. This area was not disked at the time of the 2009 survey (PMC, 2009). Barbed wire and chain-link fences surrounded this portion of the Master Plan area. Annual grassland may include common species such as wild oat (*Avena fatua*), slender oat (*A. barbata*), soft brome (*Bromus hordeaceus*), wild onion (*Allium atrorubens var. cristatum*), foxtail fescue (*Vulpia myuros var. hirsuta*), broadleaf filaree (*Erodium botrys*), turkey mullein (*Eremocarpus setigerus*), perennial ryegrass (*Lolium multiflorum*), wild mustard (*Brassica nigra*), wild radish (*Raphanus sativus*), prickly lettuce (*Lactuca serriola*), and cocklebur (*Xanthium strumarium*).

Many wildlife species use annual grasslands for foraging, but some require special habitat features such as cliffs, caves, ponds, or habitats with woody plants for breeding, resting, and cover (Kie 2005). Characteristic reptiles that breed in annual grasslands include the western fence lizard (*Sceloporus occidentalis*), common garter snake (*Thamnophis sirtalis*), and western rattlesnake (*Crotalus viridis helleri*). This habitat also provides important foraging habitat for the state-threatened Swainson's hawk (*Buteo swainsoni*), turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), northern harrier (*Circus cyaneus*), and American kestrel (*Falco sparverius*). Mammals typically found in this habitat include the black-tailed jackrabbit (*Lepus californicus*), Botta's pocket gopher (*Thomomys bottae*), western harvest mouse (*Reithrodontomys megalotis*), California vole (*Microtus californicus*), California ground squirrel (*Spermophilus beecheyi*), and coyote (*Canis latrans*).

Figure 4.9-1
Vegetative Communities within the Master Plan Area

PMC

Ruderal

The western half of the Master Plan area is undeveloped and had been disked at the time of the 2009 survey except for small strips around the perimeter (PMC, 2009). This area is regularly disked for fire prevention (Coniglio 2009); therefore, this portion of the Master Plan area is not considered annual grassland but is classified as ruderal habitat. However if the area were not disked, it would return to annual grassland. There are small cement-lined drainages on the eastern and western borders of this undeveloped portion. Generally, ruderal (roadside) communities occur in areas of disturbances such as along roadsides, trails, parking lots, etc. These communities are subjected to ongoing or past disturbances (e.g., vehicle activities, mountain bikes, mowing). Ruderal habitat in these disturbed areas supports a diverse weedy flora. Vascular plant species associated with these areas typically include Johnson grass (*Sorghum halepense*), Canadian horseweed (*Conyza canadensis*), milk thistle (*Silybum marianum*), yellow star-thistle (*Centaurea solstitialis*), wild radish, mustards (e.g., *Brassica nigra*), winter vetch (*Vicia villosa*), and field bindweed (*Convolvulus arvensis*). Fallow fields support field bindweed turkey mullein, wild lettuce (*Lactuca serriola*), prickly sow thistle (*Sonchus arvensis*), and common mallow (*Malva neglecta*). Mediterranean hoary-mustard (*Hirschfeldia incana*) and curly dock (*Rumex crispus*) are also typical of this area.

Ruderal habitats, because of their disturbed nature, support a mixture of native and exotic plant and wildlife species. Native and introduced wildlife species that are tolerant of disturbances and/or human activities often thrive in ruderal habitats. Birds and mammals that occur in these areas typically include introduced species adapted to human habitation or disturbance, including rock pigeon (*Columba livia*), European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), house mouse (*Mus musculus*), and Norway rat (*Rattus norvegicus*). Some native species persist in ruderal habitat, including western toad (*Bufo boreas*), western fence lizard, Brewer's blackbird (*Euphagus cyanocephalus*), house finch (*Carpodacus mexicanus*), American crow (*Corvus brachyrhynchos*), and California ground squirrel.

Detention Basin (Freshwater Emergent Wetland)

The detention basin within the Master Plan area is earth-lined and receives stormwater runoff from the BART station and parking lot. Water from the basin flows north under State Route (SR) 4 via a cement culvert and into another detention basin. Common cattails (*Typha latifolia*) dominate the detention basin within the Master Plan area, therefore distinguishing it as a fresh emergent wetland. Fresh emergent wetlands are characterized by erect, rooted herbaceous hydrophytes. Dominant vegetation is generally perennial monocots 2 meters (6.6 feet) tall (Kramer 1988). All emergent wetlands are flooded frequently, enough so that the roots of the vegetation are in an anaerobic environment (Kramer 1988). On the upper margins of this habitat, saturated or periodically flooded soils support several moist soil plant species including various sedges (*Carex spp.*), rushes (*Juncus spp.*), and nutsedges (*Cyperus spp.*) (Kramer 1988). The basin does not seem to be connected to a traditional navigable water; therefore, the wetland is likely to be considered isolated and not a jurisdictional feature. However, the U.S. Army Corps of Engineers (USACE) has final authority over the extent of wetlands and other waters of the United States including their jurisdiction, determination of area affected by the project, and type of permits and conditions required.

Many wildlife species are dependent on wetland habitats for foraging, nesting, and cover (Kramer 1988). Emergent wetlands provide important resting and foraging habitats for migratory birds such as mallard (*Anas platyrhynchos*), black phoebe (*Sayornis nigricans*), and red-winged blackbird (*Agelaius phoeniceus*). The disturbed and developed nature surrounding this fresh emergent wetland diminishes the value of the habitat for wildlife.

Urban (Developed)

The BART station and surrounding roads and parking lot are urban habitat. Urban habitat is distinguished by the presence of both native and exotic species maintained in a relatively static composition within a downtown, residential, or suburbia setting (McBride and Reid 1988). Vegetation in these areas consists primarily of introduced ornamental trees and shrubs and manicured lawns. Street strip vegetation, located roadside, varies with species type, but typically includes a ground cover of grass. Lawns are composed of a variety of grasses, maintained at a uniform height with continuous ground cover through irrigation and fertilization. Shrub cover refers to areas commonly landscaped and maintained with hedges, as typically found in commercial districts (McBride and Reid 1988). Wildlife species found in ruderal habitats may also occur in urban or developed habitats.

SENSITIVE HABITATS

Sensitive habitats include (a) areas of special concern to resource agencies, (b) areas protected under the California Environmental Quality Act (CEQA), (c) areas designated as sensitive natural communities by CDFG, (d) areas outlined in Section 1600 of the California Fish and Game Code, (e) areas regulated under Section 404 of the federal CWA, (f) areas protected under Section 402 of the Clean Water Act (CWA), and (g) areas protected under local regulations and policies. The freshwater emergent wetland found in the Master Plan area is potentially protected under USACE and may provide potential habitat for special-status species (e.g., tri-colored blackbird [*Agelaius tricolor*]). Special-status species and their habitat are described in more detail under the subheading Special-Status Species below. No other sensitive habitat types are documented in the vicinity of the Master Plan area (CDFG 2009a, 2009b).

The U.S. Fish and Wildlife Service (USFWS) defines critical habitat as a specific area that is essential for the conservation of a federally listed species and which may require special management considerations or protection. There are no designated critical habitat areas within the Master Plan area based on critical habitat maps for federally listed species (USFWS 2009b). The closest designated critical habitat area to the Master Plan area is approximately 1,200 feet east of the Master Plan area in the City of Walnut Creek for Delta smelt (*Hypomesus transpacificus*) (USFWS 2009b). There is no habitat for Delta smelt in the Master Plan area.

WILDLIFE CORRIDORS

Wildlife corridors refer to established migration routes commonly used by resident and migratory species for passage from one geographic location to another. Corridors are present in a variety of habitats and link otherwise fragmented acres of undisturbed area. Maintaining the continuity of established wildlife corridors is important to sustain species with specific foraging requirements, preserve a species' distribution potential, and retain diversity among many wildlife populations. Therefore, resource agencies consider wildlife corridors to be a sensitive resource. The Master Plan area is surrounded on three sides by urban development, with the existing BART station in the central portion of the area. The area to the west has also been graded and disturbed (Google Earth 2006). The Master Plan area is not suitable as a wildlife movement corridor.

Special-Status Species

The following discussion describes the plant and wildlife species that have been afforded special recognition by federal, state, or local resource agencies or organizations. Listed and other special-status species are of relatively limited distribution and may require specialized habitat conditions. They are defined as:

- Listed, proposed, or candidate for listing under the State and Federal Endangered Species Acts;
- Protected under other regulations (e.g. local policies, Migratory Bird Treaty Act);
- CDFG's Species of Special Concern and California Fully Protected Species;
- Designated as species of concern by California Native Plant Society (CNPS) (List 1A, 1B, or 2); or
- Otherwise receive consideration during environmental review.

Special-status species were considered for this analysis based on previous biological investigations and reports (Contra Costa County and City of Pittsburg 2001), a review of the California Natural Diversity Database (CDFG 2009a, 2009b), a USFWS list for endangered, threatened, and candidate species occurring in the Master Plan area (USFWS 2009a), and CNPS electronic inventory of special-status plants (CNPS 2009) (**Appendix G**). Database searches were conducted for the Honker Bay, California USGS 7.5-minute quadrangle and surrounding quadrangles (Antioch South, Clayton, Vine Hill, Fairfield South, Walnut Creek, Antioch North, Birds Landing, Denverton). Figure 4.9-2 shows the locations of previously recorded occurrences of special-status species within a 1-mile radius of the Master Plan area as recorded in CNDDB. A consolidated list of special-status species from the database searches, including rationale for considering them in the impact analysis, can be found in **Appendix G**.

Special-Status Plants

Based on the database search results, the Master Plan area is within the range of a number of special-status plant species; however, only two have suitable habitat within the Master Plan area. Table 4.9-2 lists the special-status plant species that may occur within the Master Plan area based on known range and suitability of habitat. Each special-status plant species that is considered in the impact analysis is discussed in more detail below.

TABLE 4.9-2
SPECIAL-STATUS PLANT SPECIES POTENTIALLY OCCURRING WITHIN THE MASTER PLAN AREA

<table>
<tr><th colspan="2" rowspan="2">Scientific Name</th><th rowspan="2">Common Name</th><th colspan="3">Status</th></tr>
<tr><th>Federal</th><th>State</th><th>CNPS</th></tr>
<tr><td colspan="2">California macrophylla</td><td>Round-leaved filaree</td><td>~</td><td>~</td><td>1B.1</td></tr>
<tr><td colspan="2">Centromadia parryi ssp. congdonii</td><td>Congdon's tarplant</td><td>~</td><td>~</td><td>1B.2</td></tr>
<tr><td colspan="6">Code Designations</td></tr>
<tr><td>CNPS</td><td colspan="5">List 1B = Plant species that are rare, threatened, or endangered in California and elsewhere</td></tr>
<tr><td rowspan="2">Threat Ranks</td><td colspan="5">1 – Seriously threatened in California (high degree/immediacy of threat)</td></tr>
<tr><td colspan="5">2 – Fairly threatened in California (moderate degree/immediacy of threat)</td></tr>
</table>

Source: CNPS 2009; CDFG 2009a, 2009b; USFWS 2009

Round-leaved filaree (*California macrophylla*) is designated as CNPS List 1B.1. This annual herb in the geranium family (*Geraniaceae*) occurs in cismontane woodland and valley and foothill grassland in clay soils at elevations between 50 and 3,940 feet (CNPS 2009). This species blooms between March and May. This species occurs in disturbed areas like the annual grassland and ruderal habitat found within the Master Plan area. There is one previously recorded occurrence within a 5-mile radius of the Master Plan area and five additional occurrences within a 10-mile radius (CDFG 2009a).

Congdon's tarplant (*Centromadia parryi ssp. congdonii*) is designated as CNPS List 1B.2. This annual herb in the sunflower family (*Asteraceae*) occurs in valley and foothill grassland (alkaline) at elevations between 1 and 754 feet (CNPS 2009). This species blooms between May and October, sometimes through November when conditions are suitable. This species may occur within the annual grassland habitat in the Master Plan area. This species may also occur within the ruderal habitat if conditions are suitable. There are four previously recorded occurrences within a 10-mile radius of the Master Plan area (CDFG 2009a).

Special-Status Wildlife

Based upon a records search of the USFWS and CNDDB online databases for the Honker Bay 7.5-minute USGS quadrangle and surrounding quadrangles, the Master Plan area is within the range of a number of special-status wildlife species that are of concern to the USFWS and/or the CDFG; however, only four species have suitable or marginally suitable habitat within the Master Plan area. **Table 4.9-3** lists the special-status wildlife species that, according to the database searches and suitability of habitat, may occur within the Master Plan area and therefore warrant further discussion.

TABLE 4.9-3
SPECIAL-STATUS WILDLIFE SPECIES POTENTIALLY OCCURRING WITHIN THE MASTER PLAN AREA

Scientific Name	Common Name	Status	
		Federal	State
Agelaius tricolor	Tri-colored blackbird	MCBMC	CSC
Athene cunicularia hypugea	Western burrowing owl	MCBMC	CSC
Buteo swainsoni	Swainson's hawk	MCBMC	ST
Vulpes macrotis mutica	San Joaquin kit fox	FE	ST

Code Designations	
Federal Status	***State Status***
FE *= Listed as endangered under the federal Endangered Species Act (ESA)*	***ST*** *= Listed as threatened under California Endangered Species Act (CESA)*
MNBMC*= Migratory Nongame Bird of Management Concern, protected under the Migratory Bird Treaty Act*	***CSC*** *= Species of Concern as identified by the CDFG*

Source: CDFG 2009a, 2009b; USFWS 2009

Tri-colored blackbird (*Agelaius tricolor*) is a California species of special concern and is endemic to the Central Valley and coastal valleys of California. They are highly gregarious, forming large flocks in both breeding and non-breeding seasons. Nests are built near or over water and occasionally in agricultural fields from April to July. Tri-colored blackbirds have displayed increased tendencies toward nesting in patches of blackberry, willows, mustard, thistles, nettles, and even grasses. Emergent wetland habitat associated with the detention basin in the central portion of the Master Plan area may provide marginally suitable habitat for this species. No tri-colored blackbirds were observed during the field survey conducted by PMC in 2009. There are two previously recorded occurrences within a 10-mile radius of the Master Plan area (CDFG 2009a). The tri-colored blackbird is covered by the East Contra Costa County Habitat

Conservation Plan and Natural Community Conservation Plan (HCP/NCCP) (2007), which contains conservation measures that can be implemented to reduce potential impacts to this species.

Western burrowing owl (*Athene cunicularia hypugea*) is a California species of special concern. This owl inhabits open grasslands and shrubland habitat up to 5,300 feet in elevation. This species is typically found in open grassland areas with short vegetation and the presence of small animal burrows. They use communal ground squirrel and other small mammal burrow colonies for nesting and cover, as well as artificial structures such as roadside embankments, levees, and berms. They prefer open, dry, nearly level grassland or prairie habitat and can exhibit high site fidelity, often reusing burrows year after year. This species feeds primarily on large insects and rodents, occasionally on birds and amphibians. The breeding period for this species occurs from March until May; however, the burrowing owl may be found year-round in California. Three previously recorded occurrence of burrowing owl are located less than 1 mile to the west of the Master Plan area (CDFG 2009a). There are two previously recorded occurrences within a 5-mile radius and eleven additional occurrences within a 10-mile radius of the Master Plan area (CDFG 2009a). Burrowing owl is covered by the East Contra Costa County HCP/NCCP, which contains conservation measures that can be implemented to reduce potential impacts to this species.

Swainson's hawk (*Buteo swainsoni*) is state listed as threatened. They are found during the breeding season throughout the Central Valley where suitable nesting and foraging habitat is available. Swainson's hawks often nest within or peripheral to riparian areas, adjacent to suitable foraging habitat as well as in single trees or stands of trees in agricultural fields. They are open-country birds that forage in large, open grasslands and agricultural fields, especially after the fields have been disked or harvested. Swainson's hawks can forage as far as 10 miles from the nest. Ruderal and annual grassland habitats within the Master Plan area provide suitable foraging habitat. There is no suitable nesting habitat within the Master Plan area for this species. Swainson's hawks are covered by the East Contra Costa County HCP/NCCP, whose inventory area is at the western edge of this species' range. The East Contra Costa County HCP/NCCP contains conservation measures that can be implemented to reduce potential impacts to this species.

Raptors and Other Migratory Birds

Many bird species are migratory and fall under the jurisdiction of the Migratory Bird Treaty Act (MBTA). Various migratory birds and raptor species, in addition to those described in detail above, have the potential to inhabit the project vicinity. Several migratory birds and raptors, including eagles, hawks, owls, and other birds, may occur within the vicinity of the Master Plan area. Some raptor species, such as Cooper's hawk (*Accipiter cooperii*), red-tailed hawk, and northern harrier, are not considered special-status species because they are not rare or protected under the federal Endangered Species Act (ESA) or the California Endangered Species Act (CESA); however, the nests of all raptor species are protected under the MBTA and Section 3503.5 of the California Fish and Game Code. Migratory birds forage and nest in multiple habitats. The nests of all migratory birds are protected under the MBTA, which makes it illegal to destroy any active migratory bird nest. The habitats found within and in the vicinity of the Master Plan area provide suitable nesting habitat for raptors and migratory birds. Consequently, raptor and migratory bird species are likely to forage and nest in the Master Plan area.

Mammals

San Joaquin kit fox (*Vulpes macrotis mutica*) is federally endangered and state-listed as threatened. The San Joaquin kit fox inhabits alkali sink, valley grassland, and foothill woodland areas. This fox typically hunts in areas with low, sparse vegetation, which allows for good visibility and mobility. This species burrows in the ground to form underground dens, which are used throughout the year. Typically, dens have multiple entrances. Sometimes, man-made structures such as pipes or culverts may be used as den sites by this species. This mating period for this species occurs in winter, and litters usually comprise four to seven young, which are born from February to March. There are two previously recorded occurrences within a 5-mile radius of the Master Plan area and two additional occurrences within a ten-mile radius (CDFG 2009a). The Master Plan area is not within the range for this species (East Contra Costa Habitat Conservation Plan Association 2007). San Joaquin kit fox is distributed within southern Contra Costa County, but does not extend into the Master Plan area. In addition, the Master Plan area contains very marginal habitat for this species. It is unlikely that the species would den within the Master Plan area given the disturbed nature of the Master Plan area and environs and the regular disking of the majority of the undeveloped land. The Master Plan area is also surrounded on three sides by developed land; therefore, it is unlikely that the species would migrate into the area to forage.

4.9.2 REGULATORY FRAMEWORK

This section lists specific environmental review and consultation requirements and identifies permits and approvals that must be obtained from local, state, and federal agencies before implementation of the proposed project.

FEDERAL

Endangered Species Act

The federal Endangered Species Act (ESA) protects threatened and endangered plants and animals and their critical habitat. Candidate species are those proposed for listing; these species are usually treated by resource agencies as if they were actually listed during the environmental review process. Procedures for addressing impacts to federally listed species follow two principal pathways, both of which require consultation with the United States Fish and Wildlife Service (USFWS), which administers the ESA for all terrestrial species.

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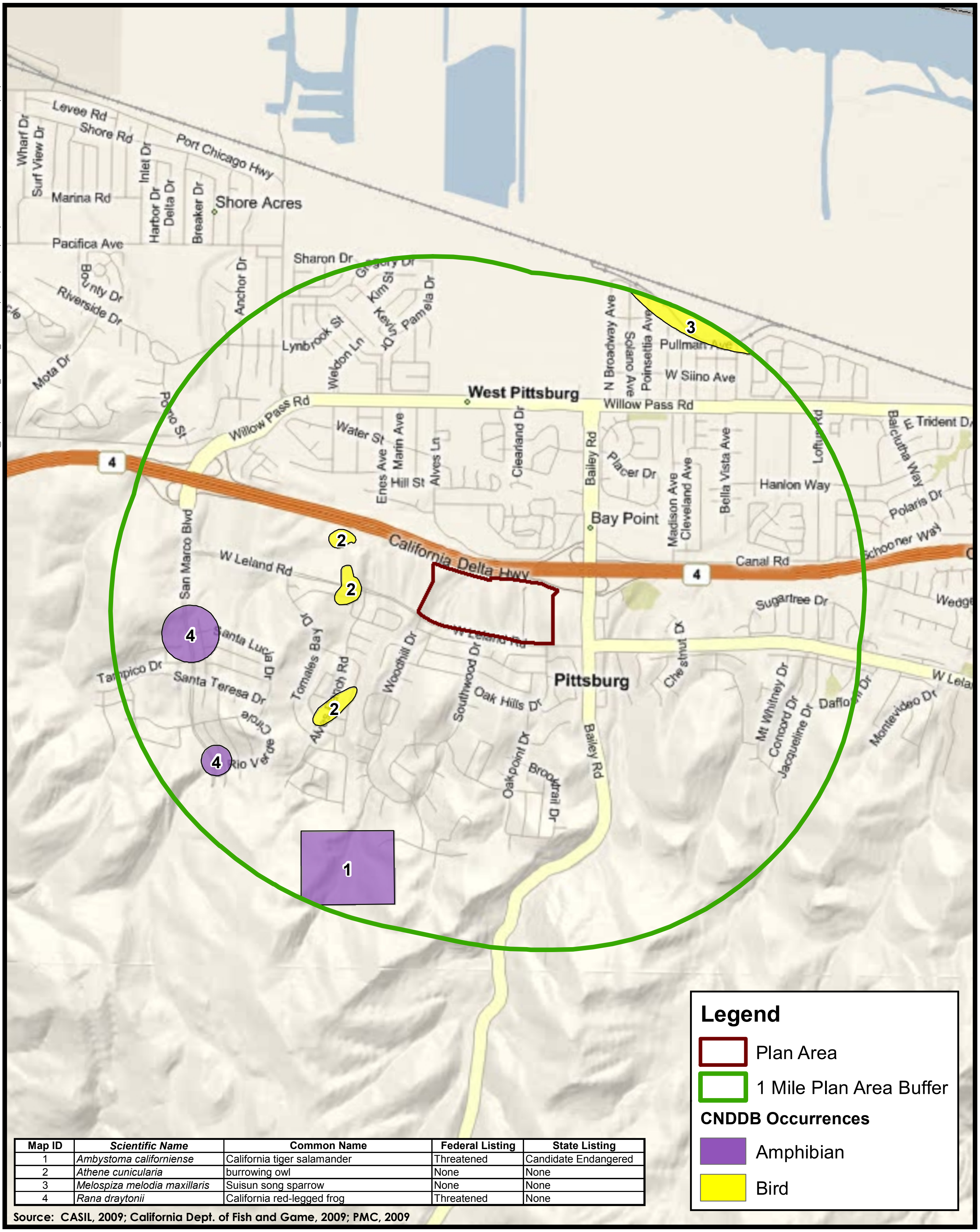

Map ID	Scientific Name	Common Name	Federal Listing	State Listing
1	*Ambystoma californiense*	California tiger salamander	Threatened	Candidate Endangered
2	*Athene cunicularia*	burrowing owl	None	None
3	*Melospiza melodia maxillaris*	Suisun song sparrow	None	None
4	*Rana draytonii*	California red-legged frog	Threatened	None

Legend

- Plan Area
- 1 Mile Plan Area Buffer

CNDDB Occurrences

- Amphibian
- Bird

Source: CASIL, 2009; California Dept. of Fish and Game, 2009; PMC, 2009

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Figure 4.9-2

Previously Recorded Occurrences of Special-status Species within a One-mile Radius of the Master Plan Area

PMC

The first pathway, Section 10(a) incidental take permit, applies to situations where a non-federal government entity must resolve potential adverse impacts to species protected under the ESA. The second pathway, Section 7 consultation, applies to projects directly undertaken by a federal agency or private projects requiring a federal permit or approval.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements international treaties between the United States and other nations devised to protect migratory birds, their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping, unless expressly authorized in the regulations or by permit. The State of California has incorporated the protection of birds of prey in Sections 3800, 3513, and 3503.5 of the Fish and Game Code (FGC).

All raptors and their nests are protected from take or disturbance under the MBTA (16 United States Code [USC], Section 703 et seq.) and California statute (FGC Section 3503.5). The golden eagle and bald eagle are also afforded additional protection under the Eagle Protection Act, amended in 1973 (16 USC, Section 669 et seq.).

Clean Water Act

Section 401 of the Clean Water Act (CWA) requires any applicant for a federal license or permit that is conducting any activity that may result in a discharge of a pollutant into waters of the United States to obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards. The appropriate Regional Water Quality Control Board (RWQCB) regulates Section 401 requirements.

Section 404 of the CWA prohibits the discharge of dredged or fill material into "waters of the United States" without a permit from the United States Army Corps of Engineers (USACE). The USACE and the U.S. Environmental Protection Agency administer the act. In addition to streams with a defined bed and bank, the definition of waters of the U.S. includes wetland areas "that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 Code of Federal Regulations [CFR] 328.3 7b). The lateral extent of non-tidal waters is determined by delineating the ordinary high water mark [33 CFR Section 328.4(c)(1)].

If adjacent wetlands occur, the limits of jurisdiction extend beyond the ordinary high water mark to the outer edge of the wetlands. The presence and extent of wetland areas are normally determined by examination of the vegetation, soils, and hydrology of a site. The majority of jurisdictional wetlands exhibit three wetland criteria: hydrophytic vegetation, wetland hydrology, and hydric soils.

Substantial impacts to jurisdictional wetlands may require an individual permit. Small-scale projects may require a nationwide permit, which typically has an expedited process compared to the individual permit process. Mitigation of wetland impacts is required as a condition of the 404 permit and may include on-site preservation, restoration, or enhancement and/or off-site restoration or enhancement. The characteristics of the restored or enhanced wetlands must be equal to or better than those of the affected wetlands to achieve no net loss of wetlands.

Executive Order 13112 – Invasive Species

Executive Order 13112 – Invasive Species directs all federal agencies to refrain from authorizing, funding, or carrying out actions or projects that may spread invasive species. The order further directs federal agencies to prevent the introduction of invasive species, control and monitor existing invasive species populations, restore native species to invaded ecosystems, research and develop prevention and control methods for invasive species, and promote public education on invasive species. As part of the proposed action, USFWS and USACE issue permits and are responsible for ensuring that the proposed action complies with Executive Order 13112 and does not contribute to the spread of invasive species.

STATE

California Endangered Species Act

Under the California Endangered Species Act (CESA), the California Department of Fish and Game (CDFG) has the responsibility for maintaining a list of endangered and threatened species (FGC 2070). Sections 2050 through 2098 of the FGC outline the protection provided to California's rare, endangered, and threatened species. Section 2080 of the FGC prohibits the taking of plants and animals listed under the CESA. Section 2081 established an incidental take permit program for state-listed species. CDFG maintains a list of "candidate species," which are species that CDFG formally notices as being under review for addition to the list of endangered or threatened species.

Pursuant to the requirements of the CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any state-listed endangered or threatened species may be present in the project study area and determine whether the proposed project will have a potentially significant impact on such species. In addition, CDFG encourages informal consultation on any proposed project that may impact a candidate species.

Project-related impacts to species on the CESA endangered or threatened list would be considered significant. State-listed species are fully protected under the mandates of the CESA. "Take" of protected species incidental to otherwise lawful management activities may be authorized under FGC Section 206.591. Authorization from CDFG would be in the form of an incidental take permit.

Native Plant Protection Act

The Native Plant Protection Act of 1977 (FGC Section 1900 et seq.) prohibits the taking, possessing, or sale within the state of any plants with a state designation of rare, threatened, or endangered (as defined by CDFG). An exception to this prohibition in the act allows landowners, under specified circumstances, to take listed plant species, provided that the owners first notify CDFG and give that state agency at least 10 days to come and retrieve (and presumably replant) the plants before they are plowed under or otherwise destroyed. (FGC, Section 1913 exempts from "take" prohibition "the removal of endangered or rare native plants from a canal, lateral ditch, building site, or road, or other right of way.") Project impacts to these species are not considered significant unless the species are known to have a high potential to occur within the area of disturbance associated with construction of the proposed project.

California Department of Fish and Game

CDFG also maintains lists of "species of special concern," which serve as species "watch lists." The CDFG has also identified many species of special concern. Species with this status have limited distribution or the extent of their habitats has been reduced substantially, such that their populations may be threatened. Thus, their populations are monitored, and they may receive special attention during environmental review. While they do not have statutory protection, they may be considered rare under CEQA and thereby warrant specific protection measures.

Sensitive species that would qualify for listing but are not currently listed are afforded protection under CEQA. The CEQA Guidelines Section 15065 (Mandatory Findings of Significance) requires that a substantial reduction in numbers of a rare or endangered species be considered a significant effect. CEQA Guidelines Section 15380 (Rare or Endangered Species) provides for assessment of unlisted species as rare or endangered under CEQA if the species can be shown to meet the criteria for listing. Unlisted plant species on the California Native Plant Society's Lists 1A, 1B, and 2 would typically be considered under CEQA.

Sections 3500 to 5500 of the FGC outline protection for fully protected species of mammals, birds, reptiles, amphibians, and fish. Species that are fully protected by these sections may not be taken or possessed at any time. The CDFG cannot issue permits or licenses that authorize the "take" of any fully protected species, except under certain circumstances such as scientific research and live capture and relocation of such species pursuant to a permit for the protection of livestock.

Under Section 3503.5 of the FGC, it is unlawful to take, possess, or destroy any birds in the orders of Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto.

State and local public agencies are subject to Section 1602 of the FGC, which governs construction activities that will substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by CDFG. Under Section 1602, a discretionary Streambed Alteration Agreement permit from CDFG must be issued by CDFG to the project developer prior to the initiation of construction activities within lands under CDFG jurisdiction. As a general rule, this requirement applies to any work undertaken within the 100-year floodplain of a stream or river containing fish or wildlife resources.

LOCAL

City of Pittsburg General Plan

The Pittsburg General Plan Resource and Conservation Element includes goals and policies to preserve, protect, enhance, and promote the city's valuable natural, cultural, and scenic resources. Table 4.9-4 analyzes the project's consistency with applicable City of Pittsburg General Plan policies. While this DEIR analyzes the Master Plan's consistency with the City of Pittsburg General Plan pursuant to CEQA Section 15125(d), the Pittsburg City Council would ultimately make the determination of the proposed project's consistency with the General Plan. Environmental impacts associated with inconsistency with General Plan policies are addressed under the appropriate impact discussion sections of this DEIR.

TABLE 4.9-4
PROJECT CONSISTENCY WITH APPLICABLE GENERAL PLAN BIOLOGICAL AND NATURAL RESOURCE POLICIES

General Plan Policies	Consistent with General Plan	Analysis
Goal 9-G-1 - Protect conservation areas, particularly habitats that support special-status species, including species that are state or federally listed as endangered, threatened, or rare.	Yes	The Master Plan Area does not include any conservation areas.
Goal 9-G-2 – Guide development in such a way that preserves significant ecological resources.	Yes	The Master Plan Area is generally disturbed and doesn't include any significant ecological resources.
Policy 9-P-1 – Ensure that development does not substantially affect special-status species, as required by State and federal agencies and listed in Table 9-1. Conduct assessments of biological resources as required by CEQA prior to approval of development within habitat areas of identified special-status species, as depicted in Figure 9-1.	Yes	A reconnaissance-level survey was conducted by PMC on April 28, 2009, to assess the biological resources within the Master Plan area. Additional surveys prior to construction activities will be conducted for special-status species with the potential to occur in the Master Plan area as required by the City in accordance with the East Contra Costa County HCP/NCCP. Preliminary analysis of the Master Plans' impact on special status species (below) identified less than significant impacts to special-status species provided the requirements of the HCP/NCCP are met.
Policy 9-P-2 – Establish an on-going program to remove and prevent the re-establishment of invasive species and restore native species as part of development approvals on sites that include ecologically sensitive habitat.	Yes	There is no ecologically sensitive habitat within the Master Plan area.
Policy 9-P-3 – Participate in the development of a regional Habitat Conservation Plan (HCP) and consider its adoption for preservation of native species throughout eastern Contra Costa County.	Yes	The proposed project will be in compliance with the adopted East Contra Costa County HCP/NCCP.
Policy 9-P-12 – Protect and restore threatened natural resources, such as estuaries, tidal zones, marine life, wetlands, and waterfowl habitat.	Yes	The emergent wetland within the detention basin in the Master Plan area will not be removed, and standard best management practices (BMPs) for erosion and sediment control will ensure there will be no indirect impacts to water quality.
Policy 9-P-19 – As part of the City's Zoning Ordinance, establish regulations for the preservation of mature trees. Include measures for the replacement of all mature trees removed.	Yes	The proposed project will be in accordance with the City of Pittsburg Street Tree Ordinance (Ord. 1036 Section 1, 1992), enacted as a result of this policy. The Master Plan Area itself does not include any mature trees.

City of Pittsburg Municipal Code

The City of Pittsburg Municipal Code (PMC) provides guidance for protecting and preserving street trees [Ord. 1036 Section 1, 1992]. PMC Chapter 12.32 contains the City of Pittsburg Street Tree Ordinance, which promotes and protects the public health, safety, and general welfare by providing for the regulation of planting, maintenance, and removal of trees within the city. PMC Section 12.32.040 indicates that the public services director will plan, administer, control, and regulate the City's street tree program. Street trees are defined as trees planted or growing within a public right-of-way, public easement, street, alley, road, or way within the city. PMC Section 12.32.070 further requires that no person may plant, cut, trim, remove, prune, shape, injure, interfere with, or do maintenance work on a street tree without first obtaining a street tree permit from the City Public Services Department.

East Contra Costa County Habitat Conservation Plan/Natural Communities Conservation Plan

The East Contra Costa County HCP/NCCP is intended to provide a comprehensive framework to protect natural resources in east Contra Costa County, while improving and streamlining the environmental permitting process for impacts on endangered and threatened species. The HCP/NCCP describes how to avoid, minimize, and mitigate the impacts on covered species and their habitats. The plan's primary goal is to streamline development projects by eliminating costly and time-consuming project-by-project permitting that often results in uncoordinated and biologically ineffective mitigation, while providing ecosystem conservation and contributing to the recovery of threatened or endangered species in California (East Contra Costa Habitat Conservation Plan Association 2007).

The East Contra Costa County HCP/NCCP entails the issuance of 30-year incidental take permits for 28 listed and non-listed species from USFWS and CDFG to local jurisdictions, allowing them to use those permits and extend take authorization to development and other projects that meet the terms of the HCP/NCCP. The plan's conservation strategy is a system of new preserves linked to existing protected lands that would preserve between 23,800 and 30,300 acres of land (East Contra Costa Habitat Conservation Plan Association 2007). The East Contra Costa County HCP/NCCP calls for the creation of an implementing entity to oversee assembly and operation of the preserve system and ensure compliance with all terms of the HCP/NCCP. The implementation entity is a Joint Exercise of Powers Authority, formed by the cities of Clayton, Pittsburg, Oakley, and Brentwood and Contra Costa County, and is called the East Contra Costa County Habitat Conservancy.

The permit area for the East Contra Costa County HCP/NCCP generally includes land within the urban limit lines in the cities of Clayton, Pittsburg, Oakley, and Brentwood and Contra Costa County. The local jurisdictions who are permittees under the HCP/NCCP include the cities of Brentwood, Clayton, Oakley, and Pittsburg, Contra Costa County, Contra Costa County Flood Control and Water Conservation District, East Bay Regional Park District, and the Conservancy. HCPs are typically voluntary; however, the participating cities (Pittsburg, Clayton, Oakley, and Brentwood) and Contra Costa County enacted ordinances that direct development projects to go through the HCP/NCCP process.

As required by the Endangered Species Act, the East Contra Costa County HCP/NCCP includes measures to avoid and minimize take of covered species, which would be included as conditions on development for applicable projects. The permit area excludes most high-quality habitat and jurisdictional waters; low-quality habitat impacts would be allowed under the East Contra Costa County HCP/NCCP. It is the responsibility of project proponents to design and implement their projects in compliance with listed measures in the HCP/NCCP. Planning surveys are required prior to permit application. Additionally, the plan divided eastern Contra Costa County into three zones, depending on habitat types, with corresponding development fees. The western half of the Master Plan area is identified as Zone 2, and the eastern half is identified as Zone 3. Approximately 4 acres of annual grassland habitat are located within Zone 3; this includes the eastern portion of the Master Plan area on the east side of the BART station.

4.9.3 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

The impact analysis provided below is based on the application of the State CEQA Guidelines Appendix G thresholds of significance. A project is considered to have significant impacts if implementation of the project will:

1) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies or regulations, or by CDFG or USFWS.

2) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies or regulations, or by CDFG or USFWS.

3) Have a substantial adverse effect on federally protected wetlands, as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.), through direct removal, filling, hydrological interruption, or other means.

4) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

5) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

6) Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

METHODOLOGY

Habitat Assessment: For areas within the Master Plan area, a habitat layer was created using the geographical information system (GIS) ArcView program based on aerial photograph interpretation and knowledge from reconnaissance-level surveys by a PMC biologist (Figure 4.9-1). A reconnaissance-level field survey of the Master Plan area was conducted on April 28, 2009, for the Master Plan area by a PMC biologist to assess habitat types and current site conditions.

Special-Status Species Assessment: The habitat mapping and field surveys were reviewed for potential habitat for the special-status species identified from the literature and database searches. A species was determined to have potential to occur in the Master Plan area if its documented geographic range from the literature and database searches includes the vicinity of the Master Plan area and if suitable habitat for the species was identified within or near the Master Plan area. The CDFG's California Natural Diversity Database was queried for a list of special-status wildlife, botanical, and fisheries resources with a potential to occur or known to occur within the Master Plan area and vicinity (CDFG 2009a, 2009b). The database search was performed for special-status species within the Honker Bay, California USGS 7.5-minute quadrangle and the surrounding quadrangles (Antioch South, Clayton, Vine Hill, Fairfield South, Walnut Creek, Antioch North, Birds Landing, Denverton). Locations of special-status species occurrences as recorded in CNDDB within a 1-mile radius of the Master Plan area are shown in Figure 4.9-2. The CNPS inventory was also searched for the quadrangles listed above for CNPS List 1A, List 1B, and List 2 special-status plants that may occur within the Master Plan area (CNPS 2009). In addition, the USFWS list for the USGS 7.5-minute quadrangles listed above was consulted for federally listed or candidate plant and wildlife species that could potentially be affected by the proposed project (USFWS 2009a). **Appendix G** includes a copy of the database searches.

When the USFWS lists a species as threatened or endangered under the Endangered Species Act, areas of habitat considered essential to its conservation and survival may be designated as critical habitat. These areas may require special consideration and/or protection due to their ecological importance. Potential critical habitat designations in the general vicinity of the Master Plan area were checked using the USFWS Critical Habitat Portal (USFWS 2009b). Designated critical habitat is not located in the general vicinity of the Master Plan area.

Impact Analysis: The analysis of impacts to biological resources presented in this section is based on previous biological investigations and reports, as well as available literature and maps from federal, state, and local agencies, the project description (Section 3.0), and the standards of significance described above. The assessment includes impacts within the Master Plan area. The exact detail of all development and impacts associated with the Master Plan is not known at this time; however, the detention basin containing emergent wetland vegetation will not be removed with implementation of the proposed project. The conservative impact approach taken for this analysis assumes that all other features will be removed and/or built upon.

PROJECT IMPACTS AND MITIGATION MEASURES

Impacts to Endangered, Threatened, and Other Listed Species

Impact 4.9.1 Implementation of the proposed project could not result in direct or indirect loss of habitat and individuals of endangered, threatened, rare, proposed, or candidate status, including plant species identified by the California Native Plant Society with a rating of List 1A or 1B (i.e., rare, threatened, or endangered plants). This would be a **potentially significant** impact.

Rare Plants

Two special-status plant species have the potential to occur in the Master Plan area or to be impacted by the proposed project according to results of database searches, a habitat survey, and/or historic records. Round-leaved filaree (CNPS List 1B.1) and Congdon's tarplant (CNPS List 1B.2) may occur within the Master Plan area. If special-status plant species are present within the impact area or temporary construction zone, they may be directly impacted by trampling, compaction, or removal. Congdon's tarplant has the potential to occur within annual grassland communities. Round-leaved filaree occurs in disturbed areas. The annual grassland and ruderal habitat in the Master Plan area contain suitable habitat for these species. If these species are present within the Master Plan area, they may be adversely impacted by implementation of the proposed project. Since there is removal of potential habitat where special-status plant species are likely to occur, the proposed project may directly affect these species if present. The loss of these plants would be a **significant** impact.

San Joaquin Kit Fox

This species is not expected to occur within the Master Plan area; therefore, the proposed project will not have impacts to this species. There is **no impact**.

Indirect Impacts of the Proposed Project

Suitable habitat for listed plant species exists within the Master Plan area. This habitat could be indirectly impacted by future development allowed under the Master Plan. Just as direct impacts would occur to habitat in which listed species are found, indirect impacts would occur as well. Indirect impacts occur for a number of reasons, though primarily through increased human/wildlife interactions, habitat fragmentation, encroachment by exotic weeds, and area-wide changes in surface water flows due to development of undeveloped areas. Habitat fragmentation is not a substantial concern due to the fact that the Master Plan Area is surrounded by urban development, precluding the presence of any interconnected habitat.

Increased Human/Wildlife Interactions

The major circulation features identified in the Master Plan would result in increased vehicular traffic (auto and pedestrian), increasing the amount and severity of indirect impacts to wildlife and habitat in the Master Plan area. Development of residential and nonresidential uses would result in increased human presence in areas formerly uninhabited by humans albeit small due to the fact that the proposed project site is surrounded by urban development. Additionally, development of previously undeveloped land for residential uses can expose species to impacts from feral and unconfined pets. Domestic cats contribute to the loss of common and special-status wildlife species (American Bird Conservancy 2007). They compete with native predators for food and transmit diseases to wildlife species (American Bird Conservancy 2007).

Changes in Surface Water Flows

As development occurs, surface water flows normally increase due to an increase in impermeable surfaces through, for example, the placement of building materials and paving over permeable surfaces. In addition, surface water flows are modified due to changes in surface flow by point source stormwater infrastructure installed in order to handle greater flows from the increasing impermeable surfaces as well as from the introduction of drainage flows during seasons when waterways and wetland features are typically dry (commonly referred to as "summer nuisance flows"). Some vegetation types that contain habitat for listed species can be indirectly impacted by such changes. Indirect impacts to special-status species could occur with implementation of the Master Plan, which may include habitat degradation as a result of impacts to water quality (see Section 4.8, Hydrology and Water Quality, regarding water quality impacts).

Although these indirect impacts would contribute to the degradation of habitat which may be used by listed species, these impacts would be minimal, as described in Section 4.8, Hydrology and Water Quality, and therefore are considered **less than significant**.

Mitigation Measures

MM 4.9.1 Prior to approval of any ground disturbing permits, project proponents within the Master Plan Area shall secure the services of a qualified biologist to prepare a Planning Survey Report (PSR) consistent with the requirements of the East Contra Costa County HCP/NCCP, along with any related supporting studies. For any special status species or habitat identified by the PSR, avoidance and minimization measures provided by the HCP/NCCP shall be implemented during both construction and operation of the project.

Separate PSRs shall be prepared for each property within the Master Plan Area prior to the time of ground disturbance for that property in the Master Plan Area.

Timing/Implementation:	*Studies shall be prepared prior to approval of any ground disturbing permits (development, grading, etc.). Avoidance and minimization measures indicated by the PSR shall be made a Condition of Approval for those permits.*
Enforcement/Monitoring:	*City of Pittsburg Development Services Department in consultation with the East Contra Costa County HCP/NCCP.*

If, during implementation of mitigation measure **MM 4.9.1** above, special status species are identified on-site, the following avoidance and minimization measures would be implemented, as a condition of the East Contra Cost HCP/NCCP:

1) Prior to any vegetation removal or ground-disturbing activities for each phase of development, focused surveys shall be conducted to determine the presence of special-status plant species with potential to occur in the impact areas. Surveys shall be conducted in accordance with CDFG Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered plants and Natural Communities (CDFG 2000). If no special-status plant species are found, then the project will not have any impacts to the species and no additional measures are necessary.

2) If special-status plant species are located within impact areas, then the City shall consult with the USFWS and/or CDFG, as applicable, to determine appropriate avoidance and minimization for special-status plants not covered under the East Contra Costa County HCP/NCCP, which may include, but is not limited to the following measures:

3) Efforts should be made to salvage portions of the plant populations that will be lost as a result of implementation of the proposed project by transplanting the plants that would be adversely affected by the proposed project for either re-establishment after construction is complete or for planting in a new area in appropriate habitat. A propagation program should be developed for the salvage and transfer of rare, threatened, or endangered plant populations from the site before the initiation of construction activities.

Implementation of the above avoidance and minimization measures as part of mitigation measure **MM 4.9.1** would ensure that impacts would be **less than significant**.

Impacts to Species of Concern, California Fully Protected, and Other Non-listed Special Status Species

Impact 4.9.2 Implementation of the proposed Master Plan could result in direct and indirect loss of habitat and individuals of animal and plant species of concern, listed as "fully protected" in the Fish and Game Code of California

(Section 3511, 4700, 5050, 5515), migratory birds protected under the Migratory Bird Treaty Act, and other non-listed special-status species. This would be a **potentially significant** impact.

Tri-Colored Blackbird

Although there is only marginally suitable habitat for this species within the emergent wetland vegetation in the detention basin, this species may occur in the Master Plan area. The fresh emergent wetland within the Master Plan area, which is highly degraded and is unlikely to contain this species, will be directly impacted by the proposed project, only during construction of the expanded basin. If construction activities will occur during the nesting season (September 1 and February 28), HCP/NCCP requirements, enforced by the City, will require that a qualified biologist conduct a nest survey to determine if birds are actively nesting within the Master Plan area or within a 250-foot buffer of construction activities, to ensure that nesting birds are not adversely impacted by construction activities. If nesting birds are present, then avoidance measures will be taken to avoid direct mortality or disturbance to the species. The loss of a large population of this species would be a **significant** impact.

Western Burrowing Owl

There is suitable habitat for western burrowing owl within the ruderal and annual grassland habitat in the Master Plan area. During construction activities, the proposed project has the potential to cause direct mortality or harm of western burrowing owl, if this species is present during grading or earthmoving work. The proposed project would directly remove or disturb up to 25 acres of annual grassland and ruderal habtiat, which this species may inhabit. Prior to construction activities at any time of the year, even if outside the nesting season, the HCP/NCCP requires that a qualified biologist conduct protocol-level surveys in suitable habitat within a 500-foot buffer of construction activities. If the species is present, then avoidance measures will be taken to avoid direct mortality or disturbance to the species including, but not limited to, buffer zones, exclusionary devices, passive relocation, etc. The loss of a large population of this species would be a **significant** impact.

Migratory Birds and Raptors

Project construction would result in habitat loss and may result in the loss of young or eggs of migratory birds or raptors. Construction activities that require the disturbance of trees such as landscaping trees located on the existing BART parking lots and vegetation could cause direct impacts to nesting raptors and migratory birds, if birds are actively nesting during construction activities. Excessive noise, disturbance and vibrations can cause nesting raptors to abandon their nests. Construction could also result in noise, dust, increased human activity, and other indirect impacts to nesting raptor or migratory bird species in the project vicinity. Potential nest abandonment and mortality to eggs and chicks, as well as stress from loss of foraging areas, would also be considered potentially significant impacts. If nesting migratory birds or raptors are present during project construction, the proposed project may cause direct mortality to raptors or migratory birds by removal of vegetation that contain active nests. If construction occurs during the non-nesting season, no impacts are expected. If construction activities were scheduled to occur during the nesting season, HCP/NCCP requirements, enforced by the City, would require a qualified biologist conduct a nest survey to identify nests within a 250-foot buffer of the Master Plan area. The loss or disturbance of active nests or direct mortality is prohibited by the MBTA and California Fish and Game Code Section 3503.5 and would represent a **significant** impact.

Indirect Impacts of the Proposed Project

Indirect impacts to species of concern and other non-listed species would be similar to those described in Impact 4.9.1 above, resulting in a significant impact.

Mitigation Measures

Implement mitigation measure **MM 4.9.1** above.

If, during implementation of mitigation measure **MM 4.9.1** above, special status species are identified on-site, the following avoidance and minimization measures would be implemented, as a condition of the East Contra Cost HCP/NCCP:

1) For trees that must be removed to construct each phase of the proposed project, the project proponent will target the removal of trees and other vegetation to occur outside the nesting season between September 1 and February 28. If trees cannot be removed outside the nesting season, pre-construction surveys will be conducted prior to vegetation removal to verify the absence of active raptor nests within 500 feet of construction activities.

    a. If construction or tree removal is proposed during the breeding/nesting season for local avian species (typically March 1 through August 31), a focused survey for active nests of raptors and migratory birds within and in the vicinity of (no less than 500 feet outside project boundaries, where possible) the project construction activities shall be conducted by a qualified biologist prior to each phase of development. Surveys shall include searches of all potential nest sites, including snags, shrubs, ground, buildings, and cliff faces. If no active nests are found, vegetation removal or construction activities may proceed.

    b. If an active nest is located during pre-construction surveys, USFWS and/or CDFG (as appropriate) shall be notified regarding the status of the nest. Furthermore, construction activities shall be restricted as necessary to avoid disturbance of the nest until it is abandoned or the biologist deems disturbance potential to be minimal. Restrictions may include establishment of exclusion zones (no ingress of personnel or equipment at a minimum radius of 250 feet around an active raptor nest and 100 feet around an active migratory bird nest) or alteration of the construction schedule.

    c. No action is necessary if no active nests are found or if construction will occur during the non-breeding season (generally September 1 through February 28).

4) A worker environmental awareness program (WEAP) shall be established and implemented prior to construction to educate the construction crew on special-status species with the potential to occur in the area, other avoidance measures. The program shall include, at a minimum, species identification, a description of suitable habitat for this species, and measures to implement in the event that this species is found during construction. The program shall be presented to all members of the construction crew during each phase of development.

Implementation of the above avoidance and minimization measures as part of mitigation measure **MM 4.9.1** would ensure that impacts would be **less than significant**.

Impacts to Sensitive Biological Communities, Including Riparian Habitat

Impact 4.9.3 Implementation of the proposed project would not result in off-site disturbance, degradation, and/or removal of sensitive biological communities. This would be a **less than significant** impact.

Implementation of the Master Plan would not result in disturbance, degradation, and removal of any known sensitive biological communities. The only communities that would be expected to be impacted with implementation of the proposed project include non-native annual grassland and ruderal habitats, which are not considered sensitive communities. Furthermore, specific surveys required by mitigation measure **MM 4.9.1** above would ensure that any sensitive species and their attending habitat are protected (see Impacts 4.9.1 and 4.9.2 above). Therefore, the master plan would have a **less than significant** impact.

Mitigation Measures

While this impact is less than significant Implementation of mitigation measure **MM 4.9.1** would further ensure the impact would remain less than significant.

Impacts to Jurisdictional Wetlands

Impact 4.9.4 The project would modify the on-site detention basin which may qualify as a federally protected wetland as defined by Section 404 of the Clean Water Act (including, but not limited to, riverine, marsh, seasonal wetland, etc.) through direct removal, filling, hydrological interruption, or other means. This is a **potentially significant** impact.

The loss or fill of jurisdictional wetlands is potentially significant under CEQA regardless of habitat quality, as the USACE has a no-net-loss policy. As the existing detention basin will not be removed by the proposed Master Plan, implementation of the proposed project will not result in loss of any wetlands or waters of the U.S. However, as there is emergent vegetation within the detention basin in the Master Plan area, direct impacts to the detention basin may occur as a result of planned expansion of the detention basin and indirect impacts may occur as described below.

Indirect Impacts

Construction activities typically include the refueling of construction equipment on location. As a result, minor fuel and oil spills may occur with a risk of larger releases. Without rapid containment and cleanup, these materials could be potentially toxic, depending on the location of the spill in proximity to water features. Oils, fuels, and other contaminants could directly affect aquatic organisms, including special-status species that inhabit the wetland areas on and off the project site. Accidental spills within the project work site and into the stormwater drainages (e.g., detention basin) could result in adverse impacts to the aquatic environment. The avoidance and minimization measure below would reduce affects from erosion, sedimentation, runoff, and accidental spills.

As the status of the detention basin cannot be determined at this time, the potential for direct and indirect impacts to a jurisdictional wetland cannot be determined. Therefore, the impact remains **significant**.

Mitigation Measures

MM 4.9.4 Prior to any disturbance within 150 feet of the on-site detention basin, a qualified biologist shall make a determination as to the jurisdictional status of the detention basin, including but not limited to a verified wetland delineation and direct consultation with the U.S. Army Corps of Engineers (USACE). If the detention basin is determined to be a jurisdictional water or wetland, then all required permits shall be secured from USACE and all avoidance and minimization measures required by the U.S. Army Corps of Engineers shall be undertaken.

Timing/Implementation: *Prior to approval of any grading permit or other ground disturbance within 150 feet of the on-site detention basin*

Enforcement/Monitoring: *City of Pittsburg Development Services Department*

The mitigation measure above would ensure that prior to any direct or indirect impact to the on-site detention basin, the jurisdictional status of the basin is determined any statutory or permit requirements are met prior to disturbance. Furthermore, mitigation measure **MM 4.9.1** would require specific studies and, if the detention basin qualifies, certain avoidance and minimization measures via the East Contra Costa County HCP/NCCP. Lastly, any future development on the project site would be required to prepare a Stormwater Pollution Prevention Plan (SWPPP), which would further protect the detention basin from indirect impacts during construction (see Section 4.8, Hydrology and Water Quality). Considering mitigation measures **MM 4.9.1** and **MM 4.9.4**, as well as the protection granted by a SWPPP, the proposed Master Plan would have a **less than significant** impact.

Impacts to the Movement of Native Resident or Migratory Fish or Wildlife Species or with Established Migratory Corridor

Impact 4.9.5 Implementation of the proposed project would not interfere with the movement of special-status and common wildlife species. There is **no impact**.

Wildlife movement corridors are routes frequently utilized by wildlife that provide shelter and sufficient food supplies to support wildlife species during migration. Movement corridors generally consist of riparian, woodland, or forested habitats that span contiguous acres of undisturbed habitat. Wildlife movement corridors are an important element of resident species home ranges. The Master Plan area is surrounded on three sides with urban habitat. It is unlikely that the Master Plan area is used by either common or special-status species as a movement corridor. The proposed project would not interfere with the movement of wildlife species; therefore, there is **no impact**.

Mitigation Measures

None required.

Conflict with the Provisions of an Adopted Habitat Conservation Plan, Natural Community Conservation Plan, or Other Approved Local, Regional, or State Habitat Conservation Plan

Impact 4.9.6 Implementation of the proposed project could conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or any adopted biological resources recovery or conservation plan of any federal or state agency through direct and indirect impacts to special status species and their habitat. This would be a **potentially significant** impact.

The proposed project is within the limits of the adopted East Contra Costa County HCP/NCCP. The western half of the Master Plan area is identified as Zone 2, and the eastern half is identified as Zone 3. Approximately 4 acres of annual grassland habitat are located within Zone 3; this includes the eastern portion of the Master Plan area on the east side of the BART station. Development on these areas could directly and indirectly impact biological resources protected by the HCP/NCCP, resulting in a potential conflict with the HCP/NCCP and a **significant** impact.

Mitigation Measures

Implement mitigation measures **MM 4.9.1** and **MM 4.9.4** above. As discussed in the impacts above, implementation of these mitigation measures, as well as a required SWPPP and other efforts outlined in this EIR (see Section 4.8, Hydrology and Water Quality) would ensure that the proposed project is consistent with the requirements of the HCP/NCCP and that the impact would be **less than significant**.

Conflict with Any Local Policies or Ordinances Protecting Biological Resources, Such as a Tree Preservation Policy or Ordinance

Impact 4.9.7 Implementation of the project would result in the loss of coniferous and black cottonwood trees currently included in landscaping on developed portions of the Master Plan Area. These losses could conflict with the Pittsburg Municipal Code and the East Contra Costa County HCP/NCCP, resulting in a **potentially significant** impact.

The Master Plan area contains numerous ornamental trees within the BART parking lot and along the perimeter of the Master Plan area. Additionally, construction of the project has the potential to adversely impact the health and viability of trees on the Master Plan area that are proposed for retention and preservation through the normal effects of earthmoving and construction. The removal of trees from the Master Plan area and the potential for construction activities to affect the health and viability of trees proposed for retention could constitute a significant impact.

The City of Pittsburg has adopted a Street Tree Ordinance, requiring that future development proposals include a discussion of any trees located along public rights-of-way which would be removed or impacted by a project. However, no such policy or ordinance exists for trees internal to a given project. Nor does the Street Tree Ordinance mandate any protection or preservation of those trees, merely that the applicant catalog the trees. Therefore, even if these trees were to be removed by future development in the Master Plan Area, no conflict with the existing ordinance would occur and the impact would be **less than significant** as it regards City ordinances and policies.

In addition to the City's ordinance, the East Contra Costa County HCP/NCCP includes specific provisions for the protection and preservation of certain trees. Loss of these trees on site could constitute a conflict with the NCCP/HCP and thus a **significant** impact.

Mitigation Measures

Implement mitigation measure **MM 4.9.1** above.

Implementation of mitigation measure **MM 4.9.1** would ensure that any trees subject to the HCP/NCCP are identified and that avoidance and minimization measures required by the HCP/NCCP are included in project approvals. These measures would include the following:

1) The following protective measures shall be implemented to avoid damage during construction to trees proposed for preservation that are located within the actual construction zone:

   a. A circle with a radius measurement from the trunk of the tree to the tip of its longest limb shall constitute the dripline protection area of each tree. Limbs must not be cut back in order to change the dripline. The area beneath the dripline is a critical portion of the root zone and defines the minimum protected area of each tree. Removing limbs that make up the dripline does not change the protected area.

   b. Temporary protective fencing shall be installed at least one foot outside of the driplines of the protected trees prior to the start of construction work, in order to avoid damage to the trees and their root systems. This fencing may be installed around the outermost dripline of clusters of trees proposed for protection, rather than individual trees. Fencing shall be shown on all project plans.

   c. No vehicles, construction equipment, mobile home/office, supplies, materials or facilities shall be driven, parked, stockpiled or located within the driplines of protected trees. A laminated sign indicating such shall be attached to fencing surrounding trees on-site.

   d. No grading (grade cuts or fills) shall be allowed within the driplines of protected trees.

   e. Drainage patterns on the site shall not be modified so that water collects or stands within, or is diverted across, the dripline of any protected tree.

   f. No trenching shall be allowed within the driplines of protected trees. If it is absolutely necessary to install underground utilities within the dripline of a protected tree, the utility line shall be bored and jacked under the supervision of a certified arborist.

   g. The construction of impervious surfaces within the driplines of protected trees shall be stringently minimized. When it is absolutely necessary, a piped aeration system shall be installed under the supervision of a certified arborist. Wherever possible, pervious concrete shall be used as an alternative to traditional concrete, when it is required under tree driplines.

   h. No sprinkler or irrigation system shall be installed in such a manner that sprays water or requires trenching within the driplines of protected trees. An aboveground drip irrigation system is recommended.

i. Landscaping beneath protected trees may include non-plant materials such as bark mulch or wood chips. The only plant species that shall be planted within the driplines of protected trees are those that are tolerant of the natural environs of the trees. Limited drip irrigation approximately twice per summer is recommended for the understory plants.

j. Any protected trees on the site that require pruning shall be pruned by a certified arborist prior to the start of construction work. All pruning shall be in accordance with the American National Standards Institute (ANSI) A300 pruning standards and the International Society of Arboriculture (ISA) Tree Pruning Guidelines.

k. No signs, ropes, cables (except those which may be installed by a certified arborist to provide limb support) or any other items shall be attached to the protected trees.

Implementation of the above HCP/NCCP requirements via mitigation measure **MM 4.9.1** would ensure that conflicts to any adopted ordinance or policy would not occur, resulting in a **less than significant** impact.

4.9.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The cumulative setting includes the Master Plan area as well as the area surrounding the city limits, where the impacts of urbanization and threats to biological diversity and sensitive biological resources are considered most serious. The impacts on biological resources are primarily the result of urbanization of the area, habitat fragmentation, water pollution, and conversion of natural land to residential, commercial, and recreational use.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Impacts to Biological Resources

Impact 4.9.8 Implementation of the proposed project, in combination with existing, approved, proposed and reasonably foreseeable development, could result in the conversion of habitat and impact biological resources. This impact is considered **cumulatively considerable**.

Development under the proposed project may result in direct and indirect impacts to plant and wildlife species and habitat conditions. Impacts to approximately 25 acres of annual grassland and ruderal communities do not contribute to the potentially significant cumulative effect of habitat loss within the region, since ruderal habitat is not valuable habitat to sensitive species and annual grassland is common in the region and loss of 4 acres of annual grassland habitat surrounded by urban development is not cumulatively considerable. In addition, the proposed project would contribute to the preservation of high-quality habitat types and contribute to the recovery of threatened or endangered species through the payment of HCP/NCCP permit fees. The East Contra Costa County HCP/NCCP provides a comprehensive framework for protecting biological resources at the County level. As the City of Pittsburg has agreed to implement the requirements of the HCP/NCCP at the City-level, including as it concerns development of the Master Plan Area, the project's contribution to cumulative habitat impacts would be minimized. As discussed in Impacts 4.9.1 and 4.9.2 above, adverse effects of habitat loss associated with the project are minimal with the application of mitigation measure **MM 4.9.1**. The avoidance and minimization measures identified in this section of the DEIR would reduce impacts to biological resources to a less than significant level. Therefore, the project's contribution to cumulative impacts to biological resources within Contra Costa County is considered **less than cumulatively considerable.**

Mitigation Measures

Implementation of mitigation measures **MM 4.9.1** and **MM 4.9.4**.

REFERENCES

American Bird Conservancy. 2007. Domestic Cat Predation on Birds and Other Wildlife. Cat Indoors: The Campaign for Safer Birds and Cats. http://www.abcbirds.org/abcprograms/policy/cats/materials/predation.pdf (accessed July 14, 2009).

California Department of Fish and Game (CDFG). 2000. Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities. Rancho Cordova, CA: California Department of Fish and Game.

———. 2002. California Wildlife Habitat Relationships (CWHR) program version 8.

———. 2009a. California Natural Diversity Database (CNDDB): QuickViewer. Sacramento, CA: CDFG, Wildlife and Habitat Data Analysis Branch. http://www.dfg.ca.gov/whdab/html/quick_viewer_launch.html (accessed April 27, 2009).

———. 2009b. California Natural Diversity Database (CNDDB) Rarefind 3 computer program, Version 3.1.1. Commercial version dated May 30, 2009. Sacramento, CA: CDFG, Biogeographic Data Branch.

California Native Plant Society (CNPS). 2009. Inventory of Rare and Endangered Plants (online edition, v7-09b 04-10-09). Sacramento, CA: California Native Plant Society. http://www.cnps.org/inventory (accessed April 27, 2009).

Coniglio, James. 2009. Discovery Builders, Inc. Personal communication. April 28.

Contra Costa County and City of Pittsburg. 2001. Pittsburg/Bay Point BART Station Area Specific Plan Environmental Impact Report (Recirculated). Prepared in conjunction with Bay Area Rapid Transit. SCH 98022071.

East Contra Costa Habitat Conservation Plan Association. 2007. East Contra Costa County Habitat Conservation Plan and Natural Community Conservation Plan (HCP/NCCP).

Google Earth. 2006. Historical Imagery dated May 24, 2006.

Kie, John G. 2005. Annual Grassland. In Mayer and Laudenslayer 1988.

Kramer, Gary. 1988. Fresh Emergent Wetland. In Mayer and Laudenslayer 1988.

Mayer, Kenneth E., and William F. Laudenslayer, Jr., eds. 1988. A Guide to Wildlife Habitats of California. Sacramento, CA: California Department of Fish and Game (CDFG).

McBride, Joe R., and Chris Reid. 1988. Urban. In Mayer and Laudenslayer 1988.

Miles, S. R., and C. B. Goudey. 1997. Ecological Subregions of California: Section and Subsection Descriptions. San Francisco, CA: USDA Forest Service, Pacific Southwest Region Publication R5-EM-TP-005.

PMC, 2009, April 28. Reconnaissance-level field survey of the Master Plan Area. Performed by PMC biologist.

Shuford, W. David, and Thomas Gardali, eds. 2008. California Bird Species of Special Concern: A ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento, California.

U.S. Fish and Wildlife Service (USFWS). 2009a. Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in Honker Bay, California topographical 7.5-minute quadrangle and surrounding quadrangles (Antioch South, Clayton, Vine Hill, Fairfield South, Walnut Creek, Antioch North, Birds Landing, Denverton). Document Number: 090427103038. Database Last Updated January 29, 2009. http://www.fws.gov/sacramento/es/spp_list.htm (accessed April 27, 2009).

———. 2009b. Critical Habitat Data Portal. Electronic online mapping program. http://crithab.fws.gov/ (accessed online April 27, 2009).

4.10 AESTHETICS

This section of the DEIR describes the existing visual resources in the vicinity of the Pittsburg/Bay Point BART Master Plan area, summarizes the landscape characteristics of the surrounding area, and discusses the potential visual, aesthetic, and light/glare impacts associated with implementation of the proposed project. Visual impacts were evaluated using a combination of site reconnaissance, photo documentation, and aerial photographs. The analysis focuses on the impacts to the site from surrounding areas.

4.10.1 EXISTING SETTING

VISUAL CHARACTERISTICS OF THE CITY OF PITTSBURG

The City of Pittsburg General Plan notes that views of the hills to the south and of the Suisun Bay to the north create a sense of identity for City residents (City of Pittsburg 2001). These southern hills lend Pittsburg residents a sense of identity. Drivers recognize the transition into Pittsburg as they crest the ridgeline on State Route (SR) 4 from Concord. Views of the hills to the south and of the Suisun Bay to the north create an identifiable entryway for the city. The Suisun Bay waterfront and marshlands constitute the city's northern boundary, while rolling, grassy hills define its southern edge. Views from the southern hills include vistas of the cityscape and the Suisun Bay beyond (City of Pittsburg 2004).

VISUAL CHARACTERISTICS OF THE PROJECT AREA AND VICINITY

The Master Plan area is a mix of both new and older residential and commercial uses, with the majority of retail development located in the Oak Hills Shopping Center east of the BART station at Bailey Road and in commercial uses along Bailey Road and Willow Pass Road. The project site slopes to the north, providing views of the Suisun Bay and the Sacramento-San Joaquin River Delta to the north and west. Rolling hills to the south provide a backdrop to existing development.

The Master Plan site is located within the viewshed from Bailey Rd/SR 4 as shown on General Plan Urban Design Element Figure 4-1 (City of Pittsburg 2001). The area surrounding the Master Plan area is a mix of residential and commercial uses typical of suburban development in the city. The properties immediately west of the Master Plan Area are currently undeveloped, save for some rough grading. However, development of these parcels is ongoing as part of the approved Alves Ranch project and is expected to be completed concurrent with development of the Master Plan[1]. The Master Plan area is approximately 3 miles to the west of Downtown Pittsburg. The Oak Hills Shopping Center, comprising an existing local shopping center including several buildings and surface parking along Bailey Road, lies immediately east of the Master Plan area. Bailey Road and more residential development are located immediately east of the shopping center. The Oak Hills residential community is located immediately to the south of and adjacent to the Master Plan site. Constructed after 1988, this development contains both single- and multi-family housing. The most visible portions of the Oak Hills community visible from the Master Plan area include a large sound wall constructed along West Leland Road with two-story homes behind that. Areas further south of the Master Plan area consist of undeveloped land and rolling hillsides with agricultural uses. The 3,000-unit San Marco subdivision is proposed to be built to the south and west of State Route 4. The area west and north of SR 4 is primarily single-family

[1] Aesthetic impacts, as well as other CEQA impacts, of the Alves Ranch project have been analyzed by the City in an EIR for the project (City of Pittsburg 2004; 2008).

housing. The Concord Naval Weapons Station is approximately 2 miles west of the Master Plan area (City of Pittsburg 2001).

Built Environment

The project vicinity contains areas of both developed and undeveloped land. The older built environment in the area generally consists of established residential areas within the unincorporated community of Bay Point in Contra Costa County north of State Route 4. The area north of SR 4 also contains multi-family housing, as well as industrial, and retail commercial uses. The majority of undeveloped space and areas of newer development are within the Pittsburg city limits to the south of State Route 4 and west of Bailey Road (City of Pittsburg 2001).

Roads and Highways

State Route 4 (SR 4), a major west-east freeway, provides regional access to the Master Plan area and is located immediately north of the Master Plan site. Bailey Road, a local arterial, runs north to south east of the site, just beyond the Oak Hills Shopping Center. The Pittsburg/Bay Point BART Station is located immediately north of the Master Plan area, in the middle of SR 4. West Leland Road is a major local east-west arterial located immediately south of the Master Plan area. Both Bailey Road and West Leland Road include typical roadway appurtenances, such as sidewalks, landscaping, and hardscape along one or both sides of the roadway in the vicinity of the Master Plan area.

Views of the southern hills from State Route 4 are afforded to eastbound traffic approaching from Concord at the western edge of the Master Plan area. Cresting the ridgeline, drivers take in views of the cityscape, the Suisun Bay, and rolling hills. Once travelers have descended the hill into the city's flatlands, the highway corridor features aging wooden fences and littered shrubs, with severely limited views of the hills to the south or the bay to the north. East of the Pittsburg/Bay Point BART Station overpass, new sound walls divide the highway from adjacent residential neighborhoods (City of Pittsburg 2001).

Visual Character of the Master Plan Area

The portion of the Master Plan area owned by West Coast Home Builders (WCHB) is undeveloped, currently containing leveled soil with some native and non-native grasses growing during the wet season (winter to spring). The parcels owned by Bay Area Rapid Transit (BART) contain a mix of developed and undeveloped land. Parcel 097-160-045, which lies immediately adjacent to the Oak Hills Shopping Center, is currently unimproved save for a wire fence along West Leland Road and a wrought iron fence along the BART parcel to the west. The portion of the parcel adjoining West Leland Road includes a sidewalk but no landscaping. The remaining BART parcels contain surface parking and vehicle approaches for the BART station, some landscaping and sidewalks, and other similar features. The northern boundary of these parcels includes single-story bus shelters for loading/unloading of passengers, one single-story retail structure, and a two-story enclosed pedestrian bridge that provides access to the BART platforms located north of the Master Plan area in the centerline of State Route 4. Pictures of the site as it existed in August of 2010 are shown in **Figures 4.10-1** through **4.10-5** below.

T:_CS\Work\Pittsburg, City of\Baypoint BART 29-0021\Figures

Southwest Corner WCHB Property - Facing North

Southwest Corner WCHB Property - Facing East

Source: PMC 2010

Figure 4.10-1

Site Photos

PMC®

T:_CS\Work\Pittsburg, City of\Baypoint BART 29-0021\Figures

Midpoint WCHB Property - Facing North

Property Line Between WCHB and BART - Facing North

Source: PMC 2010

Figure 4.10-2
Site Photos

PMC®

T:_CS\Work\Pittsburg, City of\Baypoint BART 29-0021\Figures

Midpoint BART Property - Facing North

South of Bus Shelter - Facing South

Source: PMC 2010

Figure 4.10-3

Site Photos

PMC®

Vacant BART Parcel - Facing North

Southside West Leland Road - Facing North

Source: PMC 2010

Figure 4.10-4

Site Photos

PMC®

T:_CS\Work\Pittsburg, City of\Baypoint BART 29-0021\Figures

Vacant BART Parcel - Facing South

Source: PMC 2010

Figure 4.10-5
Site Photos

Architectural Resources

The facilities of the Pittsburg/Bay Point BART Station that lie within the Master Plan area are the most prominent architectural features in the project area. They are visible from State Route 4 and from various locations along West Leland Road and Bailey Road. The Oak Hills Shopping Center is east of and adjacent to the BART station and is the largest retail commercial development in the vicinity of the Master Plan area. The Oak Hills subdivision, which contains newer, single- and multi-family homes, is located south of the BART station and exhibits typical Spanish-style suburban styling, including stucco walls, light earth tones, and red clay tile roofs (City of Pittsburg 2001; PMC 2010).

4.10.2 REGULATORY FRAMEWORK

LOCAL

City of Pittsburg General Plan

Table 4.10-1 analyzes the consistency of the proposed project with applicable policies relating to aesthetics and visual resources in the City of Pittsburg General Plan. While this DEIR analyzes the Master Plan's consistency with the General Plan pursuant to State CEQA Guidelines Section 15125(d), the Pittsburg City Council has the responsibility for ultimately determining the proposed Master Plan's consistency with the General Plan.

TABLE 4.10-1
PROJECT CONSISTENCY WITH APPLICABLE GENERAL PLAN POLICIES

General Plan Policies	Consistent with General Plan	Analysis
State Route 4 Policies		
Goal 4-G-1 – Retain views of major and minor ridgelines within the southern hills, as designated in Figure 4-2.	Yes	The General Plan identifies two points along SR 4 that provide views of the southern hills. However, as SR 4 lies well below the level of the Master Plan area, views of the southern hills are severely impacted by the earthen slope that currently exists south of the highway alignment. As these views were already limited prior to the issuance of the Notice of Preparation, this impact occurred prior to the proposed Master Plan. While the Master Plan would add structures atop that earthen slope, views were already prevented and no additional impact would occur.
Policy 4-P-3 – As part of the development review process, limit building heights and massing where views of the hills from adjacent properties and public spaces could be preserved.	Yes	See discussion under Goal 4-G-1 above. As properties north of SR 4 are even lower in elevation than the Master Plan area, views from these areas were likewise blocked by the existing grade prior to the proposed Master Plan. As such, this existing condition would not be worsened by the proposed project.

General Plan Policies	Consistent with General Plan	Analysis
Policy 4-P-61 – Retain views of the southern hills from the State Route 4 corridor, through implementation of ridgeline preservation policies (as described in Section 4.1).	Yes	Those policies of Section 4.1 [of the General Plan] that apply to the proposed project are included in this table.
Policy 4-P-62 – Support local utility providers such as PG&E in the undergrounding of utility wires.	Yes	There is no function of the Master Plan that would prevent infrastructure from being placed underground. The infrastructure plans for the Master Plan included the assumption that utilities and services would be connected underground.
Mixed-Use Areas		
Goal 4-G-16 – Establish the City's BART Stations as regional focal points, surrounded by a mix of urban activities and services.	Yes	The proposed Master Plan was designed specifically to meet this goal.
Policy 4-P-67 – Develop land uses in the BART Station Area according to the Pittsburg/Bay Point BART Station Area Specific Plan.	Yes	As described in Section 4.1, Land Use and Planning, of this DEIR, the land uses of the proposed Master Plan conform to the expectations and designations in the Specific Plan.
Policy 4-P-68: Pursue the development of a Transit Plaza, in cooperation with Contra Costa County, BART, Tri-Delta, and County Connection, adjacent to the BART Station. Such a Transit Plaza would link rapid transit, bus service, and park & ride lots within a walkable, mixed-use village.	Yes	The proposed Master Plan includes features required by this policy, including a transit plaza and a mixed-use character.
Policy 4-P-69 – Encourage all new development within the BART Station Area to focus building design, massing, and landscaping toward the pedestrian.	Yes	The proposed Master Plan was designed to accommodate not only vehicle traffic but pedestrian/bicycle traffic as a required aspect of transit-oriented development.
Policy 4-P-81 – Encourage neighborhood design—including components such as land use, development intensity, and street layout—to be responsive to natural and institutional elements, including: creeks, urban edges and adjacent land uses.	Yes	The proposed Master Plan includes provisions for connectivity and compatibility with nearby and adjacent lands. The Master Plan area does not include any creeks and is not on the urban edge.
Policy 4P-83 – Ensure that new developments provide an integrated pattern of streets and pedestrian paths that provide connections between neighborhoods. As part of the City's Subdivision Regulations, establish street connectivity requirements.	Yes	The Master Plan includes accommodation for a roadway connection to the adjacent shopping center, if such a connection becomes a possibility in the future[2]. Furthermore, the proposed Master Plan includes pedestrian connections between the Master Plan area and existing and planned adjacent development.

[2] The likelihood of a roadway connection with the Oak Hills Shopping Center is not high at this time due to the existing structures of the shopping center. However, it is anticipated by the Master Plan that the shopping center may be reconstructed/updated in the future. In order to accommodate a possible connection which may be constructed at that time, the Master Plan includes discussion of this eventuality.

General Plan Policies	Consistent with General Plan	Analysis
Policy 4-P-84 – Use traffic calming measures to reduce speeds in residential areas, rather than limiting through-street connections.	Yes	The proposed Master Plan includes a grid-based roadway network with traffic calming features such as on-street parking, narrow roadways, and a traffic circle to calm traffic rather than limiting through-street connections. The WCHB portion of the Master Plan is closed to thru-traffic, however on-site roadways within the WCHB project will be private drives and would not be subject to this policy.
Policy 4-P-85 – Provide safe and comfortable pedestrian routes through local neighborhoods by requiring sidewalks on both sides of residential streets, except in hillside areas, by planting street trees adjacent to the curb, and by minimizing curb cuts.	Yes	The proposed Master Plan includes sidewalks and greenways along most major roadways on-site.

Pittsburg Municipal Code

Chapter 18 (Zoning) of Pittsburg Municipal Code (PMC), includes requirements for lighting and glass installation with the intent of minimizing the effects of lighting and glare. Section 18.82.030, Glare, states:

a) **From Glass**. Mirror or highly reflective glass may not cover more than 20 percent of a building surface visible from a street unless an applicant submits information demonstrating to the satisfaction of the city planner that use of such glass will not significantly increase glare visible from an adjacent street and property or pose a hazard for moving vehicles.

b) **From Outdoor Lighting**. Parking lot lighting must comply with PMC 18.78.050(F). Security lighting may be indirect or diffused, or be shielded or directed away from an R district within 100 feet. Lighting for outdoor court or field games within 300 feet of an R district requires approval of a use permit.

Section 18.36 of the Pittsburg Municipal Code provides for a Design Review process for all development in the City. Pursuant to PMC section 18.36.200, design review is required for all applications for land use and building permits in each land use district other than single family residential. Therefore, typical residential subdivision projects and any non-residential development projects are subject to Design Review by the City of Pittsburg Planning Commission or delegated authority, during which it is determined whether the proposed project meets the design requirements of the PMC and any applicable plans (such as the proposed Master Plan).

Pittsburg Development Review Design Guidelines

On November 9, 2010, the Planning Commission adopted updates to the Development Review Design Guidelines, which contain development and architectural guidelines for future development. The Guidelines contain specific standards for residential, commercial and industrial uses. Generally, the guidelines are intended to assure that individual development blend harmoniously with surrounding development and that new development is constructed of high quality design and materials. Specifically, Guidelines applicable to residential and commercial development call for relief and architectural treatment on all building elevations, variation in required yards, limitation on garage frontages and long expanses of blank walls, provision of a variety of building sizes and masses resulting in varying elevations from a streetscape perspective, location of parking lots so that they do not dominate the area adjacent to public right-of-way, screening of all utilities, inclusion of recyclable areas in trash enclosures, and design of building entries as focal points, among other provisions.

4.10.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Based on criteria derived from Appendix G in the CEQA Guidelines, the proposed project would result in a significant impact to aesthetic or visual resources if the project would:

1) Have a substantial adverse effect on a scenic vista.

2) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.

3) Substantially degrade the existing visual character or quality of the site and its surroundings.

4) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area.

According to the State Department of Transportation (Caltrans), SR 4 is not a designated scenic highway. Neither is SR 4 identified as eligible for such a designation. Therefore, the Master Plan site, although adjacent to a highway, is not located near a designated scenic highway. Therefore, the proposed project would not affect aesthetic resources within the proximity of a state scenic highway. Furthermore, there are no identified historic buildings within or in the vicinity of the project site. The proposed project would not impact any nearby historic buildings or historic resources. There are no identified distinctive rock outcroppings within the project site. For these reasons, the Initial Study for the Master Plan identified no impact to such resources. No further discussion of such impacts will be included herein, pursuant to the State CEQA Guidelines.

METHODOLOGY

The existing visual character of the Master Plan area and the surrounding environment was evaluated in terms of visual aesthetics, views within the community, and consistency with plans and policies of both the City of Pittsburg and Contra Costa County. The urban quality and visual character of an area is determined by attributes of the site and by patterns in the built environment that are a result of development of the natural and/or cultural character of an area. Evaluation of potential impact on existing visual character of locations within the Master Plan area involved an analysis of project elements that would be introduced by the Master Plan, and possible physical changes to the site area and design context introduced by off-site elements (City of Pittsburg 2001). A site visit was made by PMC staff in August of 2010 and photographs taken to evaluate the existing character of the site and its potential effect on adjacent development. Those photos are shown in the figures above and were referenced along with known Master Plan aspects and physical characteristics of the site.

PROJECT IMPACTS AND MITIGATION MEASURES

Impacts to Existing Visual Character

Impact 4.10.1 The proposed project would redevelop the existing developed portions of the site and place a combination of residential and retail uses on the portion of the site which is currently vacant. This would result in an alteration of views of the site and the vicinity. Such impacts are considered **less than significant**.

The proposed project site is designated for mixed-use development on the Pittsburg General Plan and is located in the Southwest Hills planning subarea. Approximately half (the eastern portion) of the Master Plan project site is improved with asphalt parking for the BART station. The unimproved western portion of the site consists primarily of annual grasslands. A detention basin is located in the north-central portion of the site. Rolling hills and several ridgelines are visible to the south and southwest of the existing development surrounding the Pittsburg-Bay Point BART Station. Distant views of the Suisun Bay are visible to the north of the project site. To the west, distant views of the Sacramento-San Joaquin River Delta are visible from the project site.

Development expected in the Master Plan would construct new structures on what is currently a largely flat series of properties. While the Master Plan does not provide for specific heights of structures, only the eventual use of those structures, it can be assumed that the average height of structures within the Master Plan area would be two or three stories. Some structures, such as the proposed parking garages, will top this. Specifically, Garage 1 is expected to be six stories in height, and Garage 2 is expected to be four or five stories in height, depending on the actual design and parking needs of future development.

Aside from actual building massing, the Master Plan does not delineate exact architectural details or frontage improvements that would be required of future development. Rather, the Master Plan provides general guidelines and design features that would be required while providing a wide range of architectural styles. As such, it is not possible to describe how the architectural character of the Master Plan area would affect local visual style. According to the guidelines provided by the Master Plan and the tenets of typical design, it is expected that development in the Master Plan area will be similar in character to that existing in new developments south and west of the Master Plan area. While density and building height will exceed adjacent developments, the suburban visual style of adjacent development is expected to continue to some extent in the Master Plan area.

In the case of the WCHB property, a series of preliminary drawings was provided to the City. While not binding on future development, these drawings give some indication of what will eventually be constructed on the WCHB site. These preliminary drawings indicate a standard condominium/apartment development with a central courtyard, private recreation/open space uses for residents, and an internal private roadway that circles the interior of the property. Accordingly, the architectural style is expected to closely resemble local development.

The Master Plan does not address preservation or enhancement of views or particular view alignments. A viewshed includes a wide range of visual elements usually set at a long distance. The development allowed by the Master Plan would follow the alignment of existing streets and highways and is not expected to result in view blockage along regional roadways. Requirements in the Master Plan consider sight lines at street corners and intersections. The Master Plan will conform to City of Pittsburg General Plan policies calling for aesthetically pleasing roadways, strengthening community identity, the development of standards for entry points in the area, and the removal of unwanted utility poles and overhead power lines. In addition, the Master

Plan guidelines are consistent with and supportive of the City's Development Review Design Guidelines.

The distinctive barren rolling hillside landscape of the Southwest Hills planning subarea, including the project site, is particularly vulnerable to the contrasting visual impacts of urban development. One of the City's goals is to maintain the aesthetic qualities of hillside areas. The project site does not contain any General Plan designated minor or major ridgelines as identified in the General Plan Urban Design Element Figure 4-1 (City of Pittsburg 2001), but does contain areas identified as having views of the southern hills. Impacts to these views from SR 4 are discussed in Impact 4.10.2 below. Impacts to views of the Suisun Bay and points north of the project site are discussed in Impact 4.10.3 below.

Aside from blocking these views, the visual character of the Master Plan area is expected to largely conform to the overall local visual character of the area, except in height. The primary visual impact of height less than ten stories is generally in the realm of blocking views. Blocking of particular views is discussed in the following impacts and thus not discussed here. The proposed Master Plan is expected to largely conform to local visual and architectural style. Furthermore, future development in the Master Plan Area will be subject to City Design Review, ensuring any conflicts are minimized. As such, the impact is **less than significant.**

Mitigation Measures

None required.

Impacts to Views from State Route 4

Impact 4.10.2 Development of the Master Plan would introduce development adjacent to the south side of SR 4, which would alter existing views of the southern hills to motorists traveling on the highway. This impact is considered **potentially significant**.

SR 4 is located immediately north of the Master Plan area, forming its northern boundary. The Pittsburg General Plan includes identification of intermittent views of the hills to the south of the city from SR 4 along the project boundary. Except for the two-story pedestrian bridge to the BART train platforms, the bus shelter, and the single retail building on the site, the remainder of improvements to the BART properties are currently at ground level. The WCHB site is entirely undeveloped. As described in Section 3.0, Project Description, the Master Plan is expected to result in significant development on the site of various heights (see discussion under Impact 4.10.1 above). The increased height on the project site, coupled with the fact that SR 4 is currently located approximately 20 feet below the elevation of the Master Plan area's northern boundary, would likely result in near or complete blocking of views from SR 4. Furthermore, tiered tree plantings required by mitigation measure **MM 4.6.5a** (see Section 4.6, Air Quality) would likely block views as well as the trees grow and mature.

The construction of buildings on the project site may block views from SR 4 to the southern hills. However, the Master Plan does not include depictions of physical building locations or heights, only assumptions and guidelines for future development. It is understood that the height of multi-family structures in the WCHB property will likely be three stories. However, as no application for physical development has been received by the City, the actual height of construction is not certain. On-site parking garages are assumed to be five and six stories in height, however future parking needs at the time of garage development may result in lower garage heights. As such, it cannot be determined whether the few intermittent views of the southern hills identified in the

General Plan will be retained or impacted by the proposed Master Plan. During preparation of the Master Plan, concerns were raised as to this impact and land uses were arranged such that there would likely be gaps and linear views through the Master Plan area to the south. However, without specific building locations, the severity of the impact cannot be determined and the impact remains **potentially significant.**

Mitigation Measures

MM 4.10.2 Landscaping and building placement along the northern boundary of the project site shall consider viewpoints from State Route 4 to the north. To the maximum extent feasible, buildings throughout the site shall be broken up to allow for retention of viewsheds to the hills, and landscaping shall be staggered so that it does not block those views. Landscaping along the northern boundary of the Master Plan area shall be maintained and kept in good condition throughout the use of the property.

Timing/Implementation: *As a Condition of Approval for any development permit for properties adjacent to the northern Master Plan boundary*

Enforcement/Monitoring: *City of Pittsburg Development Services Department*

Mitigation measure **MM 4.10.2** would reduce the visual impact of the proposed project on views southward from the highway. Additionally, mitigation measure **MM 4.6.5b** would result in retention of intermittent views of the hills through breaks in buildings and landscaping thereby potentially reducing visual impact from SR 4. Considering the mitigation discussed above and the fact that existing views are already largely impacted by existing topography, the impact would be **less than significant**. Once more detailed information as to building design and layout becomes available during development of the Master Plan area, the impact may be reduced through design choices and other measures as a result of future environmental review.

Degrade Views from Surrounding Properties

Impact 4.10.3 Development of the Master Plan area would result in structures that could block existing views from adjacent properties of the hills south of the city and Suisun Bay to the north. This impact is considered **potentially significant.**

The scale of development included in the Master Plan would alter the existing visual character in the vicinity of the BART station, creating a more urban and dense environment. Views from the BART station platform, within the BART parking area and along West Leland Road in particular, would be altered.

The overall visual environment of the area would be changed by the introduction of structures and landscape on a previously vacant piece of land. The scale and size of development has been designed to fit within the topographical and physical character of the Master Plan site. The Master Plan outlines extensive and cohesive design concepts and guidelines intended to improve the aesthetic character of the major roadways with street furniture, signage, lighting, landscaping, and other design elements.

Expected changes to existing views from several viewpoints are described below.

Viewpoint 1: Views from South of West Leland Road toward the North

As the Master Plan area currently exists, there is little to block views northward to the Suisun Bay and the hills beyond (see **Figure 4.10-1** through **-5**). While specific building massing is not available from the Master Plan, it can be assumed that structures could be as tall as six stories in the Master Plan. According to preliminary drawings provided for the WCHB site, it is likely that the western half of the Master Plan area will be developed with three-story buildings in a ring formation around central private open space/recreational use. Due to the slope of West Leland Road, the Master Plan area lies approximately 10 feet below the grade of the roadway along its entire length. This would have the effect of cancelling out a single story's worth of height when compared to existing homes to the south. As such, residential uses constructed on the WCHB site are expected to be similar in effective height to those homes to the south that have views of the Suisun Bay. This would effectively block their existing views. Similar blockage of views would occur on the BART property, because buildings in this area, due to their limited ground area and high anticipated square footage, would likely be at least three stories in height. The modification of existing views from the south are not due to any specific design style or architectural detail of the Master Plan, rather solely by the height of structures expected to be constructed.

Existing views northward from points south of West Leland Road are already severely impacted. Most homes along the roadway are two stories in height, severely limiting the view of the Suisun Bay by other homes farther south. Essentially, no more than 45 homes and one apartment structure have potential views of the bay, assuming that up to four homes along Woodhill Drive and Southwood Drive can see the bay obliquely due to the opening created by each respective roadway. Likewise, there exists an approximately 6-foot-tall wall blocking views from back yards to the north as well as from sidewalks along Peachwillow Street and Birdhaven Way. Lastly, there are currently approximately 64 large street trees which, while deciduous, effectively block wide views of the bay during times of the year when leaves are present because the trees themselves are at least two stories tall.

Regardless of existing limitations on views of the Suisun Bay to the north, the proposed Master Plan is expected to impact those existing views further by constructing structures that are taller than existing homes south of West Leland Road. Without exact building locations, heights, or massing, which will be provided at a later date by the eventual developers of the Master Plan Area, it cannot be determined a specific degree to which these limited views may be impacted. However, implementation mitigation measure **MM 4.10.2** would allow for some broken view of the bay to remain. Given the severely impacted views currently available and the effect of mitigation measure **MM 4.10.2**, the proposed Master Plan would have a **less than significant** impact.

Viewpoint 2: Views from Future Alves Ranch Development to the East

The Alves Ranch project is located immediately west of the Master Plan area. The existence of a very tall temporary soil stockpile between the Master Plan area and the Alves Ranch area makes analysis of view impacts difficult. However, according to current rough grading on both the Master Plan area and the Alves Ranch project adjacent to the soil stockpile, the two properties are roughly analogous in elevation. As such, development on the Master Plan area of any height would have the potential to block views eastward from Alves Ranch. There are no significant or potentially significant aesthetic resources to the east that would be blocked by the proposed Master Plan. As such, this impact is expected to be **less than significant**.

Viewpoint 3: View from Bay Point to the South

Impacts to views southward from neighborhoods north of SR 4 are expected to be roughly analogous to impacts identified in Impact 4.10.1 above, for similar reasons. However, given the greater distance of those homes from the Master Plan area, it is anticipated that views of the southern hills will be largely retained. While the site will become urbanized, it will be largely similar to other suburban and urban development currently existing in the project vicinity. Additionally, requirements in the Master Plan for implementation of pleasing visual architectural details, as well as other improvements such as landscaping, would minimize the change in visual character even further. These factors, in combination with implementation of mitigation measure MM 4.10.1, would result in **less than significant** impacts.

Viewpoint 4: View from Bailey Road[3] to the West

The Oak Hills Shopping Center is currently located immediately east of the Master Plan area. Incorporating two big-box-style anchors, a strip configuration, and four satellite stand-alone retail structures, the Oak Hills Shopping Center is no more than two stories in height and is typical of other suburban retail establishments constructed in the late 1980s and 1990s. Views westward from Bailey Road are already largely blocked by the shopping center. However, structures constructed in the Master Plan area would likely overtop the shopping center structures by several structures, most notably Garage 1, which is expected to be six stories in height. As the view westward from Bailey Road is limited to the sky above the existing shopping center structures, and as there are no identified or possible aesthetic resources west of the Master Plan area, structures of additional height constructed behind the Oak Hills Shopping Center—more than 600 feet from the roadway—are expected to result in a **less than significant** impact.

Mitigation Measures

Implementation of mitigation measure **MM 4.10.2.**

New Source of Light and Glare

Impact 4.10.4 The proposed project would redevelop the existing developed portions of the site and place a combination of residential and retail uses on the portion of the site which is currently vacant. This development would expand on current urban uses in the area and create new sources of nighttime light. Existing Pittsburg Municipal Code requirements would ensure this impact is **less than significant**.

Additional sources of light such as residential, retail, parking, and streetlights and glare from vehicles entering and exiting the area would be introduced to the site as a result of future development under the Master Plan.

[3] Views westward from the Oak Hills Shopping Center are not evaluated because all public spaces, windows, building entrances, and other viewpoints in the Oak Hills Shopping Center face eastward. The orientation of the buildings blocks any other views.

Glare

In regard to glare, impacts are typically associated with the construction of buildings with large amounts of windows or metal treatments that act as high-level reflectors of bright sunlight and interfere with local traffic and/or residences. As shown in the design guidelines for the Master Plan, this is not the type of development envisioned by the Master Plan. Rather, design will likely comprise windows with architectural details spaced on solid walls. Regardless, the potential exists that windows placed along West Leland Road and in any south-facing alignment could become a source of glare for properties south of the Master Plan area.

While the final design of windows to be installed in the Master Plan area has not been developed and cannot be known at this time, development in the Master Plan area will be required to conform to Section 18.82.030 of the Pittsburg Municipal Code, limiting the amount of highly reflective glass allowed on buildings in the city. Conformance with the Pittsburg Municipal Code and the design requirements of the Master Plan would result in a **less than significant** impact related to glare.

Light

Lights are a part of any development, especially development expected of the Master Plan. While the Master Plan does not include any land use or feature that would be expected to generate a large, new source of nuisance light (e.g., a stadium or sports field), development in the Master Plan area would likely contain typical lights for mixed-use development including sign lights, architectural lights on buildings, street lamps, entryway lights, and other such lighting. Lighting that is upward facing or unshielded (bare bulbs are visible) can cause a nuisance for adjacent residents, especially if these lights are left on at all hours of the night. Furthermore, certain high-intensity safety lights, such as mercury-halide lamps commonly installed at service areas for commercial/retail establishments, can cause a hazard to drivers if it impacts their ability to see and avoid obstacles and people while driving.

Specific lighting designs and locations will be developed as the Master Plan builds out over time by the individual property owners and developers undertaking development of the Master Plan area. However, the Master Plan does include requirements that lighting in public spaces be downward facing, or directed at a building frontage, and that those lights be shielded, thereby eliminating much of the potential spillover lighting impact of the Master Plan. That, coupled with the fact that the proposed Master Plan does not include any land uses or features that would generate large amounts of light, indicates that the proposed Master Plan would have a **less than significant** impact related to light and glare.

Mitigation Measures

None required.

4.10.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The cumulative setting for visual resources is the general vicinity of the Master Plan area that is seen from and can see the Master Plan area. Given the hills to the south and the gentle slopes to the north toward the Suisun Bay, this area is roughly analogous to the portions of Pittsburg that lay south of the Master Plan area and the community of Bay Point. Development expected to occur in this area and that is thus part of the cumulative setting is described in Section 4.0, Assumptions.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Aesthetic Impacts

Impact 4.10.5 Development in the Master Plan area, together with reasonably foreseeable development in areas immediately adjacent to the Master Plan area, may have a cumulative impact on visual quality. This impact is considered **less than cumulatively considerable.**

The cumulative area as a whole has been undergoing urbanization and development over the last 20 years. The essential character of the portion of the City of Pittsburg that lies west of Bailey Road has changed during this time from an area of open fields and relatively undisturbed hillsides to encompass typical suburban development (i.e., large tracts of homes with commercial/public spaces interspersed throughout, served with a typical local/collector/arterial/highway style roadway network). While the proposed Master Plan would be expected to result in more dense development than what currently exists in the area, the overall character of the cumulative setting will remain the same.

The proposed project is substantially surrounded by existing residential and commercial development, save for its western side. To the west lies Alves Ranch, to be developed as a relatively high density single family residential neighborhood with areas of high density housing, according to the project approved by the City of Pittsburg. As such, the cumulative setting is largely built out and the Master Plan Area can be considered an infill project for the purposes of aesthetic analysis. As such, development of the proposed Master Plan would constitute a continuance of the existing visual character of the cumulative setting and the overall impact would be **less than cumulatively considerable**.

The proposed project may, through the height of structures that may be constructed in the Master Plan area, block some views from the freeway of the southern hills. However, this is a project-specific impact and has thus been addressed in Impact 4.10.2 above.

Mitigation Measures

None required.

REFERENCES

City of Pittsburg. 2001. Pittsburg 2020: A Vision for the 21st Century. City of Pittsburg General Plan. Includes Amendments through July 2010.

———. 2004. Draft Environmental Impact Report for the Vista Del Mar Project: Alves Ranch Project. SCH. No. 2004012097.

———. 2008. Addendum to the 2004 Envrionmental Impact Report for the Vista Del Mar Project: Alves Ranch Project. SCH No. 2004012097.

———. 2009. Pittsburg Municipal Code.

Contra Costa County and City of Pittsburg. 2001. Pittsburg/Bay Point BART Station Area Specific Plan Environmental Impact Report (Recirculated). Prepared in conjunction with Bay Area Rapid Transit. SCH 98022071.

PMC. 2010. Site visit by Kevin Freibott, Senior Planner, PMC, August. Site reconnaissance, photographs taken.

4.11 PUBLIC SERVICES AND UTILITIES

This section discusses the public service and utility systems that would serve the Master Plan area including fire protection and emergency services, police protection, school facilities, water supply, wastewater services, solid waste disposal, and electricity and telephone services. For impacts regarding parks and recreation, see Section 4.12, Recreation, of this DEIR. For impacts regarding storm drainage, see Section 4.8, Hydrology and Water Quality.

4.11.1 FIRE PROTECTION AND EMERGENCY SERVICES

This section of the DEIR evaluates the impacts on fire protection services as a result of the proposed Master Plan. The existing fire protection services provided by the Contra Costa County Fire Protection District (CCCFPD) are discussed and the demand for increased services and accessibility are evaluated. This analysis is based on upon review of the project and consultations with CCCFPD.

4.11.1.1 EXISTING SETTING

CCCFPD provides fire protection and suppression services for the City of Pittsburg and the surrounding Bay Point community. In addition, the district also provides primary fire protection service to the majority of Contra Costa County, including Antioch, Clayton, Concord, Lafayette, Martinez, Pleasant Hill, and San Pablo. CCCFPD also provides fire prevention services to all unincorporated areas including Alamo (north of Livorna), El Sobrante, North Richmond (unincorporated), and Pacheco. CCCFPD is also contracted to provide fire prevention, plan review, and fire investigation services to Bethel Island, Brentwood, Byron, Discovery Bay, Knightsen, and Oakley. The eastern portion of the county is protected by East Contra Costa Fire Protection District. CCCFPD has a mutual aid agreement with the East Contra Costa Fire Protection District for emergency response (Leach 2010).

CCCFPD operates out of 30 fire stations located throughout its jurisdictional area. Battalion 8 provides fire protection and suppression services for Pittsburg, Antioch, and the surrounding unincorporated areas including Bay Point. Battalion 8 has the following personnel and equipment:

- 24 firefighters (at least 8 of whom are paramedics)
- 1 battalion chief
- 2 ladder trucks (Quints)
- 5 Type 1 engines (used to fight structural fires; have minimum pump capacities of 1,000 gallons per minute [gpm])
- 1 Type 2 engine (used to fight structure fires; have minimum pump capacities of 500 gpm)
- 4 Type 3 engines (used to fight wildland fires; have minimum pump capacity of 500 gpm)
- 1 Type 3W engine (lightweight construction Type 3 engine)
- 2 Type 4 engines (used to fight wildland fires; have minimum pump capacity of 70 gpm)
- 1 fireboat (Zodiac, swift water rescue)

- 1 mass casualty trailer (used to supply medical equipment for large numbers of people)
- 1 breathing support unit (mobile breathing air compressor)
- 1 water tender (used to transport water for fighting fires)

The above equipment and personnel are distributed among eight stations including Stations 84, 85, and 87 in Pittsburg; Stations 81, 82, 83, and 88 in Antioch; and Station 86 in Bay Point. **Table 4.11.1-1** lists station facilities.

TABLE 4.11.1-1
FIRE STATION LOCATIONS AND FACILITIES, PITTSBURG PLANNING AREA

Station	Location	Facilities	Distance	Direction
Station 84	1903 Railroad Avenue	Quint, Powerwagon	3.6 miles	Northeast
Station 85	2331 Loveridge Road	Engine, Powerwagon	4.2 miles	Southeast
Station 86	3000 Willow Pass Road, Bay Point	Engine, Powerwagon	0.75 miles	North
Station 87	800 West Leland Road, Pittsburg	Engine, Powerwagon	1.5 miles	Southeast

Source: City of Pittsburg 2001
Note: Distance and direction to each station is approximate and based on the geographic center of the Master Plan area.

Station 87, located at 800 West Leland Road, would be the primary responding station to the Master Plan area (Leach 2010). However, given the existing station network and existing mutual aid agreement (see above), actual response to a significant emergency may come from any of these stations, as well as from stations of adjacent fire districts.

RESPONSE STANDARD AND ISO RATING

CCCFPD has an Insurance Service Office (ISO) rating of 3 (Leach 2010). ISO is a private organization that surveys fire departments in cities and town across the United States. Fire departments are rated on a scale from 1 to 10. Class 1 represents the best public protection, and Class 10 indicates no recognized protection. This rating considers a community's fire defense capacity versus fire potential and then uses the score to set property insurance premiums for homeowners and commercial property owners (City of Pittsburg 2001). The ISO rating is based on a number of factors, including personnel, facilities, response times, fire flow capacities, and the general character of development in the area (Contra Costa County 2001).

CCCFPD receives approximately 42,000 urban fire calls per year from within the district. About 10,500, or 25 percent, of these calls are from East County, which includes the City of Pittsburg (City of Pittsburg 2001).

CCCFPD operates a countywide early warning system for industrial fires. Called the Community Warning System, sirens installed at industrial facilities automatically sound when an incident occurs. The system also alerts residents via television and radio announcements.

Areas in Pittsburg representing the greatest fire risk are the hills south of the city, which are brown and dry for much of the year. Wildland fires in eastern Contra Costa County are a continuous threat, with the highest risk occurring during the wildland fire season, from June to October. Much of the threat is due to open grasslands abutting residential developments. As Pittsburg continues to expand, more urban-wildland interface areas are created (City of Pittsburg 2001). For more information on wildland fire, the reader is referred to Section 4.3, Hazards, of this DEIR.

The district's goal is to respond and provide service within five minutes of notification. Generally, service can be provided in this time frame to areas located within 1.5 miles of a fire station. CCCFPD has a primary response time threshold of five minutes to 90 percent of all service calls (Leach 2010).

4.11.1.2 REGULATORY FRAMEWORK

STATE

California Occupational Safety and Health Administration

In accordance with the California Code of Regulations, Title 8 Sections 1270 Fire Prevention and 6773 Fire Protection and Fire Fighting Equipment, the California Occupational Safety and Health Administration (Cal/OSHA) has established minimum standards for fire suppression and emergency medical services. The standards include, but are not limited to, guidelines on the handling of highly combustible materials, fire hose sizing requirements, restrictions on the use of compressed air, access roads, and the testing, maintenance, and use of all firefighting and emergency medical equipment.

Uniform Fire Code

The Uniform Fire Code (UFC) contains regulations relating to construction, maintenance, and use of buildings. Topics addressed in the code include fire department access, fire hydrants, automatic sprinkler systems, fire alarm systems, fire and explosion hazards safety, hazardous materials storage and use, provisions intended to protect and assist fire responders, industrial processes, and many other general and specialized fire-safety requirements for new and existing buildings and the surrounding premises. The UFC also contains specialized technical regulations related to fire and life safety.

California Health and Safety Code

State fire regulations are set forth in Sections 13000 et seq. of the California Health and Safety Code, which includes regulations for building standards, fire protection and notification systems, fire protection devices such as extinguishers, smoke alarms, high-rise building, childcare facility standards, and fire suppression training.

LOCAL

City of Pittsburg General Plan

The City of Pittsburg 2020 General Plan Health and Safety Element and Public Facilities Element include goals and policies related to fire protection. **Table 4.11.1-2** analyzes the proposed project's consistency with applicable City of Pittsburg General Plan policies. While this DEIR analyzes the project's consistency with the City of Pittsburg General Plan pursuant to CEQA Section 15125(d), the Pittsburg City Council has final responsibility for ultimately determining the proposed Master Plan's consistency with the General Plan. Environmental impacts associated with inconsistency with General Plan policies are addressed under the appropriate impact discussion sections of this DEIR.

TABLE 4.11.1-2
PROJECT CONSISTENCY WITH APPLICABLE GENERAL PLAN FIRE PROTECTION POLICIES

General Plan Policies	Consistent with General Plan	Analysis
Health & Safety		
Policy 10-P-36 – Maintain, modernize, and designate new sites for emergency response facilities, including fire and police stations, as needed to accommodate population growth.	Yes	CCCFPD has indicated that no new facilities would be needed to accommodate development of the Master Plan area. However, all new development is required to pay a per unit fee, in the case of residential development, and a per square foot fee, in the case of commercial and/or industrial development in order to fund improvements or operating costs necessary to support new development.
Public Facilities		
Policy 11-P-29 – Ensure adequate road widths in new development for fire response trucks, per the subdivision regulations.	Yes	The proposed Master Plan includes a network of internal roadways, including two new planned access points onto West Leland Road in addition to the three existing access points. These roadways will provide multiple access points for emergency response vehicles, equipment, and personnel into the Master Plan area. While final design of these roadways has not been completed, CCCFPD indicated in consultation with City staff that the roads as depicted would likely be acceptable.

4.11.1.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Project impacts are considered significant if the project results in the following:

1) Substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for fire protection.

METHODOLOGY

The analysis of fire protection impacts is based on review of the project and consultations with CCCFPD by City staff. As discussed in Section 4.0, Assumptions, the proposed Master Plan is expected to result in 1,168 residential units, 1,300 employees, and 146,362 acres of nonresidential development. Using a rate of 3.20 persons per household, as discussed in Section 4.2, Population, Housing, and Employment, the project would result in a population of 3,738 new residents.

PROJECT IMPACTS AND MITIGATION MEASURES

Fire Protection

Impact 4.11.1.1 The proposed Master Plan could increase the need for fire protection and emergency response during the operational phase. However, the increased demand would not result in the expansion or construction of facilities that could result in a physical effect, resulting in a **less than significant** impact.

By increasing the number of structures as well as the number of residents and employees within CCCFPD's service area, implementation of the proposed Master Plan would increase the potential need for emergency or fire response from CCCFPD. As described in the Existing Setting subsection, Fire Station 87 is located within 1.5 miles of the Master Plan area at 800 West Leland Road. The Master Plan area is accessible from Fire Station 87 within five minutes of notification. CCCFPD indicates that current staffing levels and facilities at Station 87 are adequate to address increased service demands resulting from the proposed Master Plan. Therefore, any increased need for fire or emergency response would not trigger the need for additional fire facilities to maintain service standards. Since the emergency response criteria would be met, it is unlikely that development from the proposed Master Plan would adversely affect the District's ISO rating. In addition, all new development is required to pay $235 per unit for single family and multi-family residential development, and between 0.07 and 0.22 cents per square foot fee in the case of industrial and commercial development, respectively. Those fees are used to fund increased costs for increased fire protection-related services. Therefore, this impact is considered **less than significant**.

Mitigation Measures

None required.

4.11.1.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The cumulative analysis for the proposed Master Plan considers geographic areas and population and employment growth projections for jurisdictions that are served by CCCFPD. The cumulative setting includes the areas of north and central Contra Costa County, which are served by CCCFPD. Impacts may result from increased calls for service associated with the proposed Master Plan in combination with other reasonably foreseeable development as anticipated by the general plans for these communities and the Pittsburg/Bay Point BART Station Area Specific Plan.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Impacts to Fire Protection

Impact 4.11.1.2 Implementation of the proposed Master Plan, in combination with other reasonably foreseeable development, would increase the number of accidents, calls, and responses within the CCCFPD service area and require additional fire services. However, this impact would be **less than cumulatively considerable**.

Because additional development within the CCCFPD service area would result in additional calls for service, it is reasonable to conclude that proposed and approved new development would lead to cumulative impacts on CCCFPD. As noted above, all new development is required to pay $235 per unit for single family and multi-family residential development, and between 0.07 and 0.22 cents per square foot fee in the case of industrial and commercial development, respectively. Those fees are used to fund increased costs for increased fire protection-related services.

Under cumulative conditions, CCCFPD anticipates requiring additional facilities. However, the proposed Master Plan would not require an increase in staffing and equipment that would trigger the need for new or expanded facilities on its own. Furthermore, the City of Pittsburg General Plan anticipated development in the Master Plan area, and the development proposed by the Master Plan is less intense than that assumed in the General Plan (see Section 4.1, Land Use and Planning).

When future fire protection and emergency medical facilities are required, the location, size of facility, and potential environmental impacts resulting from the provision of new fire protection and emergency medical facilities and equipment will need to be determined. A project-level CEQA document for future development within the Master Plan area would analyze the potential environmental impacts of a fire facility project. Such an analysis, along with any necessary mitigation measures, would occur once an application for a project is submitted to the appropriate agency. The physical impacts resulting from the construction of new fire protection and emergency medical related facilities are generally short-term and temporary air quality and noise impacts. Other adverse impacts (i.e., water quality, erosion, biological resources, etc.) may result, depending on site-specific conditions and proximity to waterways and other important resource areas. CCCFPD review of new development projects for adequate water supply and pressure, fire hydrants, access to structures by firefighting equipment and personnel, compliance with established fire codes, and on-site fire suppression systems would ensure that the cumulative impacts of development in CCCFPD's service area are less than significant and the project's fire protection impact is **less than cumulatively considerable**.

Mitigation Measures

None required.

4.11.2 POLICE PROTECTION

This section of the DEIR evaluates the impacts on law enforcement services as a result of the proposed Master Plan. The existing law enforcement services provided by the City of Pittsburg Police Department are discussed and the demand for increased services and accessibility are evaluated. This analysis is based upon review of the project and consultations with the Pittsburg Police Department.

4.11.2.1 EXISTING SETTING

The City of Pittsburg Police Department provides police services to the area encompassed by the city boundaries. The Police Station is located at City Hall at 65 Civic Avenue, approximately 3 miles from the Master Plan area to the east. The department does not have response time thresholds to maintain. However, response time to the Master Plan area is estimated to be two minutes (Callahan 2009).

The Pittsburg Police Department has an authorized staff level of 76 sworn employees and 28 non-sworn employees. The city is divided into nine patrol beats (Contra Costa County 2008). Each beat is staffed with four officers who work 10-hour shifts. The closest beat to the BART station is Beat 4. The department assesses the potential impacts of new development on police protection services by taking into account the coverage areas and staffing needs for each beat. The type of crime and estimated amount anticipated in a particular beat are considered (Contra Costa County/City of Pittsburg 2001).

BART POLICE

BART Police are responsible for security and law enforcement on all BART-owned properties. BART is not responsible for policing development on property owned by West Coast Home Builders (WCHB). Current BART police staffing at the Pittsburg/Bay Point BART Station involves the full-time deployment of a non-sworn officer and rotating beat coverage of a sworn officer who patrols the Pittsburg/Bay Point station, Concord station, and north Concord area. The non-sworn officer's duties include parking enforcement at the BART parking lot and general observation of security conditions at the station area. The non-sworn officer is essentially a community service assistant who provides a full-time security presence and routinely coordinates with the beat sworn officer as needed. The non-sworn officer defers to the sworn officer in law enforcement situations. The Pittsburg/Bay Point BART Station has the highest incidence of auto theft and third highest of auto burglary in the BART system. The combination of these statistics places the Pittsburg/Bay Point BART Station in the #2 position for crime among all stations in the BART system (Contra Costa County 2001).

4.11.2.2 REGULATORY FRAMEWORK

LOCAL

City of Pittsburg General Plan

The City of Pittsburg 2020 General Plan Health and Safety Element includes goals and policies related to police protection. **Table 4.11.2-1** analyzes the proposed project's consistency with applicable City of Pittsburg General Plan policies. While this DEIR analyzes the project's consistency with the City of Pittsburg General Plan pursuant to CEQA Section 15125(d), the Pittsburg City Council has the responsibility for ultimately determining the proposed Master Plan's consistency with the General Plan. Environmental impacts associated with inconsistency with General Plan policies are addressed under the appropriate impact discussion sections of this DEIR.

TABLE 4.11.2-1
PROJECT CONSISTENCY WITH APPLICABLE GENERAL PLAN LAW ENFORCEMENT POLICIES

General Plan Policies	Consistent with General Plan	Analysis
Policy 10-P-39 – Strive to maintain a ratio of 1.8 sworn police officers per 1,000 residents.	Yes	Development within the Master Plan area would include 1,168 dwelling units. Assuming 3.20 persons per household, the project would result in a population of 3,738 new residents. According to the General Plan, this population would result in the need for approximately 7 new officers in order to maintain that ratio (3,738 x [1.8/1,000]). All new development is subject to a special Community Facilities District special tax (2005-1) to pay for police services that would pay for any additional officers needed to maintain this ratio.

4.11.2.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Project impacts are considered significant if the project results in the following:

1) Substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for police protection.

METHODOLOGY

The analysis of police protection impacts is based on review of the project and consultations with the City of Pittsburg Police Department and BART Police. As discussed in Section 4.0, Assumptions, the proposed Master Plan is expected to result in 1,168 residential units, 1,300 employees, and 146,362 acres of nonresidential development. Using a rate of 3.20 persons per household, as discussed in Section 4.12, Population, Housing, and Employment, the project would result in a population of 3,738 new residents.

PROJECT IMPACTS AND MITIGATION MEASURES

Police Protection

Impact 4.11.2.1 The proposed Master Plan could increase the need for police services; however, the increased demand would not result in the expansion or construction of facilities that could result in a physical effect. This would be a **less than significant** impact.

As a result of additional development expected of the Master Plan, the Pittsburg Police Department expects an increase in police activity related to the proposed Master Plan. Additional service demands related to the new residences and commercial uses are expected to result in an increased workload. In the event that the proposed Master Plan results in a need for additional police officers, current Pittsburg Police Department facilities are adequate to house additional police officers, and the department does not anticipate substantial depletion in emergency response time related to the proposed Master Plan (Callahan 2010). In August 2005, the city of Pittsburg authorized a special tax in all new development (special tax No. 2005-1, to fund a Community Facilities District (CFD). This annual special tax pays for new authorized police services in the area. These services include police protection for the residents of the CFD (both sworn and non-sworn personnel), as well as equipment and support staff, to deliver patrol, investigations, community policing, traffic, criminal justice, and code enforcement services. The special tax applies to all new residential and non-residential development as well as expansions of existing development that will result in new, occupied square footage. These revenues would provide the funding for additional police officers required due to the proposed project.

During consultation with City staff, the City of Pittsburg Police Department indicated their desire that security cameras be installed throughout the project site to monitor public areas. Installation of these cameras would occur at the project level and would have negligible environmental effects. Nor would the installation of cameras reduce the need for policing of the Master Plan area by any measurable amount.

As the proposed project would not require the construction of additional police facilities, the addition of substantial numbers of officers, or any other significant change in police activity, the impact is considered to be **less than significant**.

Mitigation Measures

None required.

4.11.2.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

For law enforcement, the cumulative context consists of the City of Pittsburg, which is served by the Pittsburg Police Department. BART would assume responsibility for law enforcement within the Pittsburg/Pay Point BART Station. Impacts may result from increased calls for service associated with the proposed Master Plan in combination with other reasonably foreseeable development as anticipated by the City's General Plan and the Pittsburg/Bay Point BART Station Area Specific Plan.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Impacts to Police Protection

Impact 4.11.2.2 The proposed Master Plan, in addition to proposed and reasonably foreseeable development, would increase the demands on the City of Pittsburg Police Department and BART Police, and require additional law enforcement services under cumulative conditions. This would be a **less than cumulatively considerable** impact.

The demands for police services that will arise from future development under the proposed Master Plan, in addition to the demands for services for other proposed and/or approved projects in Pittsburg, would have a cumulative impact on the Pittsburg Police Department. In addition to the added responses to calls for non-emergency services that would arise in the Master Plan area, the approval of other proposed projects would have a cumulative impact on law enforcement services. The City of Pittsburg Police Department would be expected to add staff in addition to necessary police equipment to maintain acceptable levels of service if the proposed Master Plan and other proposed developments are approved. As described above, it is anticipated that the existing Communities Facilities District special tax for police services would be adequate to fund any required improvements from future development.

Furthermore, the City of Pittsburg General Plan anticipated development on the Master Plan area, and the development proposed by the Master Plan is less intense than that assumed in the General Plan. However, if future law enforcement facilities are required, the location, size of facility, and potential environmental impacts would be evaluated on a project-specific basis in a separate environmental document. As with the majority of public service facilities, the physical environmental impacts resulting from facility construction are generally short term and would result in temporary resource impacts. A project-level CEQA document would analyze the potential environmental impacts of a law enforcement facility project. Such an analysis, along with any necessary mitigation measures, would occur once an application for a project is submitted to the appropriate agency. Given that the proposed Master Plan would not require the construction of new law enforcement facilities or the alteration of existing facilities and that the Pittsburg General Plan anticipated mixed use urban development on the project site, this impact would be **less than cumulatively considerable**.

Mitigation Measures

None required.

4.11.3 SCHOOLS

This section of the DEIR addresses public school services as related to the proposed Master Plan, as well as changes in public school financing associated with the Leroy F. Greene School Facilities Act of 1998 (Government Code Sections 65995–65998).

4.11.3.1 EXISTING SETTING

Educational facilities within the City of Pittsburg include elementary and secondary schools, a community college, and a public library. All of the public schools in Pittsburg are within either the Pittsburg Unified School District or the Mount Diablo Unified School District. The Master Plan area is served by the Mount Diablo Unified School District.

In addition to elementary and secondary schools, two continuation schools, two private parochial schools (Saint Peter Martyr School and Lighthouse Christian Center School), and Los Medanos Community College operate within the city.

MOUNT DIABLO UNIFIED SCHOOL DISTRICT

Mount Diablo Unified School District (MDUSD) spans several cities within Contra Costa County, including parts of the City of Pittsburg. District facilities in the community of Bay Point (within the Pittsburg Planning Area) include three elementary schools (grades K–5), one middle school (grades 6–8), and one continuation school. Residents of the future project would be directed to the schools closest to the Master Plan area including Bel Air Elementary School located at 663 Canal Road in Bay Point, 0.75 miles northeast of the Master Plan area, and Riverview Middle School, located at 205 Pacifica Avenue in Bay Point, 1.25 miles northeast of the Master Plan area. Several MDUSD schools within the Pittsburg Planning Area have reached or are nearing capacity. The expansion of residential development into the southern hills will also result in the need for additional MDUSD school sites within city limits. Proposed schools include Delta View Elementary School and potential conversion of an existing school site within the Planning Area to a high school facility. (MDUSD 2010)

High school students living in the Master Plan area would attend Mount Diablo High School in Concord. Mount Diablo High School is currently operating under capacity. Students living in the Master Plan area can use BART to the Concord BART Station and transfer to a bus at the County Connection to reach the high school.

EXISTING ENROLLMENT AND FACILITIES CAPACITY

The Master Plan area is located within MDUSD, which provides public school services for grades kindergarten through 12th grade as well as some adult education. Enrollment and existing capacity figures are provided in **Table 4.11.3-1**.

TABLE 4.11.3-1
MDUSD EXISTING ENROLLMENT AND CAPACITY

School	Existing Enrollment	Existing Capacity	Percentage of Capacity
Bel Air Elementary	406	702	58%
Riverview Middle	749	893	84%
Mt. Diablo High School	1,610	n/a	n/a

Source: Enrollment: MDUSD 2009. Capacity: City of Pittsburg 2001
Note: Current capacity at Mt. Diablo High School was not available.

4.11.3.2 REGULATORY FRAMEWORK

STATE

Leroy F. Greene School Facilities Act of 1998 (SB 50)

California voters approved Proposition 1A in November of 1998. Proposition 1A's companion legislation (Chapter 407, Statutes of 1998, SB 50) went into effect on the measure's approval. Senate Bill (SB) 50 significantly altered the system of fees that can be placed on new development in order to pay for the construction of school facilities. Prior to the passage of Proposition 1A, school districts were limited in the amount of school facility developer fees they could charge. Also, as a result of the Mira, Hart, and Murietta decisions made in the years preceding the passage of Proposition 1A, cities and counties were able to impose additional school facility fees on development as a condition of obtaining land use approval. SB 50 and Proposition 1A provided a comprehensive school facilities financing and reform program by authorizing the $9.2 billion school facilities bond issue, school construction cost containment provisions, and an eight-year suspension of the Mira, Hart, and Murrieta court cases. SB 50 created different levels of developer fees and prohibited local agencies from denying either legislative or adjudicative land use approvals on the basis that school facilities are inadequate. They also reinstated the school facility fee cap for legislative actions, which is adjusted biannually in January. According to Government Code Section 65996, the development fees authorized by SB 50 are deemed to be full and complete school facilities mitigation. These provisions were in effect until 2006 and will remain in place as long as subsequent state bonds are approved and available.

The three levels of developer fees established by SB 50 are described below.

- Level 1 fees are base statutory fees. As of January 30, 2008, the maximum assessment for fees was $2.97 per square foot of residential development and $0.47 per square foot of commercial/industrial development.
- Level 2 fees allow the school district to impose developer fees above the statutory levels, up to 50 percent of certain costs under designated circumstances. The state would match the 50 percent funding if funds are available.
- Level 3 fees apply if the state runs out of bond funds after 2006, allowing the school district to impose 100 percent of the cost of the school facility or mitigation minus any local dedicated school monies.

In order to levy the alternate (Level 2) fee and qualify for 50 percent state matching funds, a school district must prepare and adopt a School Facilities Needs Analysis, apply and be eligible for state funding, and satisfy specified criteria. The ability of a city or county to impose fees is limited to the statutory and potential additional charges allowed by the act, as described above. In January, 2010, the State Allocation Board approved an annual adjustment for MDUSD, setting grant amounts to:

- $8,738 for each elementary school pupil;
- $9,241 for each middle school pupil (including 6th grade, if part of a 6-8 school); and
- $11,757 for each high school pupil.

California Department of Education

The California Department of Education (CDE) establishes standards for school sites pursuant to Education Code Section 17251 and adopts school site regulations, which are contained in the California Code of Regulations, Title 5, commencing with Section 14001 (CDE 2008). Certain health and safety requirements for school site selection are governed by state regulations and the policies of the CDE School Facilities Planning Division (SFPD) relating to:

- Proximity to airports, high-voltage power transmission lines, railroads, and major roadways;
- Presence of toxic and hazardous substances;
- Hazardous facilities and hazardous air emissions within one-quarter mile;
- Proximity to high-pressure natural gas lines, propane storage facilities, gasoline lines, pressurized sewer lines, or high-pressure water pipelines;
- Noise;

Results of geological studies or soil analyses; and

- Traffic and school bus safety issues.

The School Facilities Planning Division's Guide to School Site Analysis and Development assists school districts in determining the amount of land needed to support their educational programs in accord with their stated goals and in accord with recommendations of the CDE. Site size standards were updated in 1999–2000 to reflect significant changes in education, such as class size reduction in kindergarten through grade three, implementation of the (federal) Education Amendments of 1977, Title IX (gender equity), parental and community involvement, and technology. In addition to the educational reforms noted above, changes regarding the expanded use of buildings and grounds for community use and agency joint use and legislative changes in the site-selection process regarding environmental, toxic, and other student and staff safety issues were included in the updated standards. The guide contains specific recommendations for school size and suggests a ratio of 2:1 between the developed grounds and the building area. CDE is aware that in a number of cases, primarily in urban settings, smaller sites cannot accommodate this ratio. In such cases, the SFPD may approve an amount of acreage less than the recommended gross site size and building-to-ground ratio.

The Kindergarten-University Public Education Facilities Bond Act of 2002 (Prop. 47)

This act was approved by voters in November 2002 and provides for a bond issue of $13,050,000,000 (thirteen billion fifty million dollars) to fund necessary education facilities to relieve overcrowding and to repair older schools. Funds will be targeted to areas of greatest need and must be spent according to strict accountability measures. Funds will also be used to upgrade and build new classrooms in the California community colleges, the California State University, and the University of California to provide adequate higher education facilities to accommodate growing student enrollment.

LOCAL

City of Pittsburg General Plan

The City of Pittsburg 2020 General Plan Open Space, Youth and Recreation Element includes goals and policies related to schools. **Table 4.11.3-3** analyzes the proposed project's consistency with applicable City of Pittsburg General Plan policies. While this DEIR analyzes the project's consistency with the City of Pittsburg General Plan pursuant to CEQA Section 15125(d), the Pittsburg City Council has the responsibility for ultimately determining the proposed Master Plan's consistency with the General Plan. While the City cannot require school districts to comply with General Plan policies, cooperation is necessary to ensure proper timing between residential and school development. Environmental impacts associated with inconsistency with General Plan policies are addressed under the appropriate impact discussion sections of this DEIR.

TABLE 4.11.3-3
PROJECT CONSISTENCY WITH APPLICABLE GENERAL PLAN SCHOOL AND EDUCATION POLICIES

General Plan Policies	Consistent with General Plan	Analysis
Policy 8-P-39 – Work with Mount Diablo Unified School District to ensure that the timing of school construction and/or expansion is coordinated with phasing of new residential development.	Yes	Implementation of the proposed Master Plan would not necessitate the construction or expansion of any new schools. See Impact 4.11.3-1 below for more information. Representatives from MDUSD participated in the early phases of development of the Master Plan. Later consultation with the MDUSD was

General Plan Policies	Consistent with General Plan	Analysis
		attempted as part of the preparation of this EIR; however no response was received from the District. Consultation with MDUSD is expected to occur as part of future development proposals in the Master Plan Area. In addition, all new development will pay mandatory school fees for all new development.
Policy 8-P-41 – As part of development review for large residential subdivisions (greater than 100 units), evaluate the need for new school sites. If needed, encourage subdivision design to accommodate school facilities and cooperate with the school districts in acquisition of those sites.	Yes	See discussion under policy 8-P-39 above.

4.11.3.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Project impacts are considered significant if the project results in the following:

1) Substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for schools.

METHODOLOGY

The analysis of public school impacts is based on consideration of the estimated number of students generated by the project and consultations with the school districts. As discussed in Section 4.0, Assumptions, the proposed Master Plan is expected to result in 1,168 residential units, 1,300 employees, and 146,362 square feet of nonresidential development. Using a rate of 3.20 persons per household, as discussed in Section 4.2, Population, Housing, and Employment, the project would result in a population of 3,738 new residents.

Student Generation Projections

Implementation of the proposed Master Plan would generate a projected maximum of 1,168 dwelling units. Based on the student generation rates use in the Specific Plan EIR, approximately 408 students would be generated by the buildout of the proposed residential land uses in the Master Plan. See **Table 4.11.3-4** below for the student generation rates used to obtain these numbers.

TABLE 4.11.3-4
PROPOSED MASTER PLAN STUDENT GENERATION RATES

Grades	Generation Rate for Multi-Family	Students Generated[1]
K–5	0.18	210
6–8	0.08	93
9–12	0.09	105
	Total Students Generated	**408**

Source: City of Pittsburg 2001
Notes: [1]Generation rate multiplied by the number of multi-family units (see Section 4.0).

PROJECT IMPACTS AND MITIGATION MEASURES

Impacts to Schools

Impact 4.11.3.1 Proposed land uses in the Master Plan would result in generation of 408 new students to be enrolled in the Mount Diablo Unified School District. This impact is considered **less than significant**.

Implementation of the proposed Master Plan is projected to result in population growth within the MDUSD area, resulting in increased enrollment at MDUSD schools. Projected growth associated with implementation of the proposed Master Plan would increase student enrollment by 408 students, which could result in the need for new school facilities and support personnel. Areas of possible impact include, but are not limited to, the following:

- Classrooms
- Offices, including corporate offices
- Maintenance and transportation facilities
- Personnel for each department

As shown in **Table 4.11.3-4** above, development under the proposed Master Plan could generate 210 elementary school students, 93 middle school students, and 105 high school students. **Table 4.11.3-1** shows that MDUSD has room for an additional 296 students at Bel Air Elementary and 144 students at Riverview Middle School. While available capacity at Mt. Diablo High School was not available, recent news posted by MDUSD on their website pointed to declining enrollment at the High School, reinforcing the assumption that 105 additional high school students would be less than significant (MDUSD, 2010). Therefore, existing MDUSD schools surrounding the Master Plan area have adequate capacity to handle the students generated by the proposed Master Plan.

The City has no direct control over the location and construction of schools. However, it does have approval authority over subdivision maps that may propose school sites. The City also makes decisions on infrastructure projects that may be required to support a new or expanded school, such as water and sewer lines and roadways. New schools, or the expansion of existing schools, would contribute environmental impacts through increased traffic, noise, potential habitat loss, air quality, water service, water quality, wastewater, solid waste, public services, and the conversion of agricultural lands. MDUSD would be required to perform an environmental review of any significant expansion of school facilities or development of new school facilities to comply with CEQA.

In addition, it should be noted that California Government Code Sections 65995(h) and 65996(b) provide full and complete school facilities mitigation for California Environmental Quality Act (CEQA) purposes. Section 65995(h) states that the payment or satisfaction of a fee, charge, or other requirement levied or imposed pursuant to Section 17620 of the Education Code is deemed to be full and complete mitigation of the impacts for the planning, use, development, or provision of adequate school facilities. Current MDUSD fees are set at 2.97 per square foot for new residential development and 0.47 per square foot for new commercial development. Per California Government Code Sections 65995(h) and 65996(b), the existing fee mechanisms would fully mitigate the environmental effects of the increased population. Payment of SB 50 fees, which are required prior to issuance of a building permit or Certificate of Occupancy, as applicable, would ensure adequate school facilities are available for the students generated by the proposed Master Plan. This impact is therefore considered **less than significant**.

Mitigation Measures

None required.

4.11.3.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The Master Plan area is served by the Mount Diablo Unified School District. The MDUSD service area encompasses approximately 150 square miles and serves the cities of Concord, Pleasant Hill, and Clayton, portions of Walnut Creek, Pittsburg, and Martinez, and unincorporated areas, including Lafayette, Pacheco, Clyde, and Bay Point. Therefore, the cumulative setting for public school impacts is the MDUSD service area. The reader is referred to Section 4.0, Assumptions, of this DEIR for a discussion of anticipated development in the area.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Impacts to Schools

Impact 4.11.3.2 Implementation of the proposed Master Plan, as well as potential development within the cumulative setting area, would result in cumulative public school impacts. These cumulative public school impacts are considered **less than cumulatively considerable**.

New schools planned within MDUSD would provide additional capacity to accommodate existing and future enrollment. Additional development would be subject to mitigation consistent with payment of fees as established between the school district, the state, and the local jurisdictions. Current MDUSD fees are set at 2.97 per square foot for new residential development and 0.47 per square foot for new commercial development. In accordance with the Leroy F. Greene School Facilities Act, local jurisdictions are restricted in imposing additional impact fees. Pursuant to state law, payment of statutory fees represents full and complete school facilities mitigation. Per California Government Code Sections 65995(h) and 65996(b), the existing fee mechanisms would fully mitigate the environmental effects of the increased population.

A currently vacant 11.3 acre vacant site intended to house a new K-8 school site was identified in 2004 as part of the approval process for the Vista Del Mar subdivision. The proposed school site is located within one mile of the Master Plan site and it is very likely that children from the Master Plan site would attend the future school. The environmental effects of construction and operation of this school was included in an EIR certified by the City in December 2004 (State Clearinghouse Number 2004012097). The proposed project would not modify that portion of the Vista Del Mar project. Therefore, no additional documentation of environmental effects of construction and operation of that school are required.

As discussed above, the increase in students due to implementation of the proposed Master Plan would not exceed capacity of MDUSD schools. Furthermore, the Pittsburg General Plan has already anticipated development on the Master Plan area with mixed use urban development. Therefore, this impact is considered **less than cumulatively considerable**.

Mitigation Measures

None required.

4.11.4 WATER SUPPLY

4.11.4.1 EXISTING SETTING

Raw water is delivered to the City of Pittsburg by the Contra Costa Water District (CCWD) via the Contra Costa Canal. That raw water is then treated at the City's Water Treatment Plant (WTP). A small percentage of potable water in the city is provided by two groundwater wells located close to the geographic center of the project. While the water is largely sourced from CCWD, the City is the water service provider for the entire incorporated city area, including the Master Plan Area. A Water Supply Assessment (WSA) was completed for the proposed Master Plan was completed in 2010 (City of Pittsburg, April 2010) and is included as **Appendix H**.

RAW WATER

The Contra Costa Water District (CCWD) serves approximately 400,000 people throughout north-central and east Contra Costa County. Its clients also include 10 major industries, 36 smaller industries and businesses, and 50 agricultural users. CCWD operates raw water distribution facilities, water treatment plants, and treated water distribution facilities. CCWD supplies raw and treated water to Antioch, Concord, Diablo Water District (serving Oakley), Pittsburg, Southern California Water Company (serving Bay Point), Martinez, and parts of Pleasant Hill and Walnut Creek.

CCWD is entirely dependent on the Delta for its water supply. CCWD's principal water supply and delivery system comprises the Contra Costa Canal and Los Vaqueros Project. CCWD diverts unregulated flows and regulated flows from storage releases from Shasta, Folsom, and Clair Engle reservoirs into the Sacramento River as a contractor of the U.S. Bureau of Reclamation's Central Valley Project (CVP). Under Water Service Contract I75r-3401 (amended) with the Bureau, CCWD can divert and re-divert up to 195,000 acre-feet annually (AFA) of water from Rock Slough and the new Old River intake.

Currently, CCWD uses between 125,000 and 140,000 AFA. CCWD can also divert up to 26,780 AFA of water from Mallard Slough under its own water rights (Water Rights License No. 3167 and Permit No. 19856). The City of Antioch and Gaylor Container, both customers of the district, also have water rights permits to divert water from the Delta.

The actual amount of water supplied is subject to regulatory or temporary restrictions that may be imposed during drought conditions or other conditions. While CCWD can divert up to 26,780 AFA of water from Mallard Slough when water quality is considered acceptable (generally under 100 milligrams of chlorine per liter), when this supply is used it must be deducted from the CVP supply. However, these seasonal variations in water supply were accounted for by CCWD in their Future Water Supply Study and even with seasonal variations supply was determined to be adequate to meet need regarding certain actions planned by CCWD to improve supply (see below).

TREATED WATER

The City of Pittsburg provides water to properties within the incorporated city limits via the Pittsburg WTP. According to the latest Water System Master Plan (2010), 85–95 percent of water provided to customers in the city is provided from CCWD. The remainder is provided by two existing groundwater wells located at Dover Road and Frontage Road. Each well yields approximately 800 acre-feet annually.

According to the Water System Master Plan, the Pittsburg water treatment plant currently operates at 16 to 18 mgd but has a maximum capacity of 32 mgd. However, the California Department of Public Health currently limits production to 28 mgd.[1] Treated water is distributed throughout the city through a 211-mile pipeline system with associated booster pump stations and eight reservoirs with a combined capacity of 19.25 million gallons.

WATER SUPPLY AND DEMAND

Raw Water

CCWD prepared a Future Water Supply Study in 2002. An update to a similar study in 1996, the 2002 study analyzed projected demand in the CCWD service area and compared it to existing entitlements and expected water supplies through the year 2050. The analysis in the Future Water Supply Study was based on current land use and historical consumption data as well as on future projections provided by local planning efforts, general plans, and water system master plans.

Existing demand was calculated according to the existing population in the service area multiplied by the average water usage at the time, approximately 197 gallons per day (gpd). Also factored into the existing demand analysis was consideration of major water users such as two major power-producing projects in the City of Pittsburg (which have since come online). This included consideration of a percentage of those plants' needs expected to be met by recycled water.

Future demand was calculated according to future land use expectations of major customers (including the City of Pittsburg) and the Contra Costa County Department of Conservation and Development. For the City of Pittsburg, land use assumptions were provided by City staff and demand projections were developed in close consideration of the Pittsburg Water System Master Plan (see below).

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[1] This cap on production is dependent on ambient air temperature—specifically in cases where the ambient air temperature falls below 10 degrees Celsius. As this is an exceedingly rare event, the functional maximum capacity of the Pittsburg WTP is considered to be 32 mgd.

The Future Water Supply Study found that future needs could be met through a combination of efforts. New conservation efforts (which have since been implemented) were expected to provide 38 percent of future need. Reclamation efforts (similarly under way) were expected to provide 17 percent. The City has indicated that these efforts are providing adequate water supply for their needs (City of Pittsburg, 2010). In order to fill the need for the additional 45 percent, the preferred alternative presented in the study was the transfer of existing water rights from nearby suppliers. CCWD has done this in the past and maintains sufficient relationships with other purveyors to secure such transfers.

Transfer of existing water rights to CCWD would occur incrementally over time as development and growth required additional water rights. As the actual rate of growth could not be determined with any accuracy, it was left open as to when this might occur, though it was projected to be required by 2008. Likewise, the study identified possible future sources of water transfers, but also could not be certain as to exact sources, as they were not needed at the time and future conditions could change. In all cases, it was anticipated that transfers of existing water rights would occur. As such, no new sources of water would be required (i.e., digging of new wells or draw of additional surface water). Potential sources of future water supplies included:

- East Contra Costa Irrigation District
- Western Water Company
- Yuba County Water Agency
- Wetlands Water District

As discussed above, CCWD provides raw water to the City of Pittsburg. Future projections for water demand in the City of Pittsburg (raw water only, excluding the City's two wells) are shown in **Table 4.11.4-1** below.

TABLE 4.11.4-1
CCWD PROJECTIONS – OVERALL CCWD DEMAND AND RAW WATER TO PITTSBURG

Service Area	Demand Projections (acre/feet per annum)				
	2010	2020	2030	2040	2050
CCWD System	189,392	201,581	207,134	211,674	214,567
Pittsburg (% of Total)	12,493 (6.6%)	14,546 (7.2%)	14,955 (7.2%)	15,369 (7.3%)	15,786 (7.4%)

Source: CCWD 2010.

As shown in **Table 4.11.4-1**, the City of Pittsburg makes up a relatively small proportion of water demand for CCWD. Also, the City's share of water demand from CCWD is not expected to increase by any significant amount.

Treated Water

The City of Pittsburg prepared and adopted a Water System Master Plan in October 2010, which included an analysis of water demand versus supply. The Water System Master Plan took into account land uses described in the City's General Plan as well as detailed assumptions for expected development to occur in the near future. According to the findings of the Water

System Master Plan, the City is anticipated to have adequate water supplies to accommodate future growth, provided that improvements called for in the Water System Master Plan are constructed. These improvements include new distribution lines to be installed as development occurs in order to serve new development and the installation of pump stations and reservoirs. The Water System Master Plan did not call for the need for any additional sources of water.

Urban Water Management Plan

The City adopted an Urban Water Management Plan (UWMP) in 2005 outlining existing and projected water use and future demand for water resources. Historic and projected water demand in the City from the City's UWMP is shown in **Table 4.11.4-2** below. Demand factors for future years assumed a demand rate of 180 gallons per capita per day. Future population projections were developed according to the assumptions of the General Plan, which included development of the Master Plan area at a greater density/intensity than what is currently proposed by the Master Plan (see Section 4.1, Land Use).

TABLE 4.11.4-2
HISTORIC AND PROJECTED FUTURE WATER DEMAND – PITTSBURG UWMP

Year	Population	Million Gallons Per Day Annually	Acre/Feet Annually	Gallons Per Capita Per Day
1980	33,500	2,057	6,313	168
1985	39,800	2,413	7,405	166
1990	46,500	3,120	9,575	184
1995	51,500	3,185	9,774	169
2000	59,500	3,430	10,526	158
2005	62,605	4,113	12,622	180
2010	67,800	4,454	13,669	180
2015	73,800	4,848	14,878	180
2020	80,700	5,302	16,271	180
2025	87,800	5,768	17,701	180
2030	95,500	6,276	19,260	180

Source: City of Pittsburg 2005

The Pittsburg UWMP also included an analysis of available supply and compared it to the demand projections shown above. **Table 4.11.4-3** shows a summary of that comparison.

TABLE 4.11.4-3
PROJECTED SUPPLY AND DEMAND COMPARISON – PITTSBURG UWMP

Year and Condition	Total Demand	Available Supply	Supply Deficit	
		CCWD and Groundwater	Percent	Acre/Feet/Year
2005				
Normal	12,622	13,622	0	0
2010				
Normal	13,669	13,669	0	0
Single-Year Drought	13,669	13,669	0	0
Multi-Year Drought (yr 1)	13,669	13,669	0	0
Multi-Year Drought (yr 2)	13,669	13,023	5.1	646
Multi-Year Drought (yr 3)	13,669	11,769	15	1,900
2015				
Normal	14,872	14,872	0	0
Single-Year Drought	14,872	14,872	0	0
Multi-Year Drought (yr 1)	14,872	14,872	0	0
Multi-Year Drought (yr 2)	14,872	14,137	5.3	735
Multi-Year Drought (yr 3)	14,872	12,791	15	2,081
2020				
Normal	16,271	16,271	0	0
Single-Year Drought	16,271	16,271	0	0
Multi-Year Drought (yr 1)	16,271	16,271	0	0
Multi-Year Drought (yr 2)	16,271	15,401	5.7	870
Multi-Year Drought (yr 3)	16,271	13,980	15	2,291
2025				
Normal	17,701	17,701	0	0
Single-Year Drought	17,701	17,701	0	0
Multi-Year Drought (yr 1)	17,701	17,701	0	0
Multi-Year Drought (yr 2)	17,701	16,699	6	1,002
Multi-Year Drought (yr 3)	17,701	15,196	15	2,505
2030				
Normal	19,260	19,260	0	0
Single-Year Drought	19,260	19,260	0	0
Multi-Year Drought (yr 1)	19,260	19,260	0	0
Multi-Year Drought (yr 2)	19,260	18,128	6.2	1,132
Multi-Year Drought (yr 3)	19,260	16,521	15	2,739

Source: City of Pittsburg 2005.

As shown above, the City is expected to have adequate supplies through the year 2030 unless a two or three year multi-year drought is experienced. In the worst case scenario, a three-year drought, the City anticipates that supplies would be deficient by approximately 15 percent. Both CCWD (2001) and the City of Pittsburg (2005) identify possible solutions to these possible shortfalls, including an emergency intertie with the East Bay Municipal Utility District. The CCWD Future Water Supply Study (2001) identified that the possible deficits identified above (and those identified for the CCWD system as a whole) could be met by transfer of existing water rights from adjacent water purveyors through connections that already exist for use in time of extreme drought.

4.11.4.2 REGULATORY FRAMEWORK

FEDERAL

Safe Drinking Water Act

The Safe Drinking Water Act is the main federal law that ensures the quality of Americans' drinking water. The act authorizes the United States Environmental Protection Agency (EPA) to set national health-based standards for drinking water, known as the National Primary Drinking Water Regulations, to protect against both naturally occurring and man-made contaminants that may be found in drinking water. The regulations set enforceable maximum contaminant levels for particular contaminants in drinking water and required ways to treat water to remove contaminants. Each standard also includes requirements for water systems to test for contaminants in the water to make sure standards are achieved. In addition to setting these standards, the EPA provides guidance, assistance, and public information about drinking water, collects drinking water data, and oversees state drinking water programs (EPA 2011). The EPA oversees the states, localities, and water suppliers who implement the standards. The Safe Drinking Water Act applies to every public water system in the United States.

STATE

California Safe Drinking Water Act

The California Safe Drinking Water Act (CA SDWA) was passed to build on and strengthen the federal Safe Drinking Water Act. The CA SDWA authorizes the California Department of Public Health to enforce both the federal and state acts and protect the public from contaminants in drinking water through regulation of public water systems (Scorecard 2009).

California Department of Public Health Drinking Water Program

The California Department of Public Health's (CDPH) Drinking Water Program (DWP) is within the Division of Drinking Water and Environmental Management. The DWP regulates public drinking water systems and is responsible for the enforcement of the federal and California Safe Drinking Water Acts and the regulatory oversight of 7,500 public water systems. The CDPH Field Office Branch staff perform field inspections, issue operating permits, review plans and specifications for new facilities, take enforcement actions for noncompliance with laws and regulations, review water quality monitoring results, and support and promote water system security. In addition, Field Office Branch staff are involved in funding infrastructure improvements, conducting source water assessments, evaluating projects utilizing recycled treated wastewater, and promoting and assisting public water systems in drought preparation and water conservation (California Department of Public Health 2009). The CDPH also establishes maximum contaminant levels

(MCLs) that are at least as stringent as those developed by the EPA, as required by the federal Safe Drinking Water Act. The CDPH lists any contaminants that may have any adverse health effects, based on expert opinion, and may occur in public water systems, including all the substances for which federal MCLs exist (Scorecard 2009). The CDPH works with the EPA, the State Water Resources Control Board, Regional Water Quality Control Boards, and a wide variety of other parties interested in the protection of drinking water supplies (California Department of Public Health 2009).

Urban Water Management Planning Act and Amendments

The California Department of Water Resources provides urban water management planning services to local and regional urban water suppliers. In 1983, the California Legislature enacted the Urban Water Management Planning Act (Water Code Sections 10610–10656). The act states that every urban water supplier that provides water to 3,000 or more customers, or that provides over 3,000 acre-feet of water annually, should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry years. The act requires that urban water suppliers develop water management plans to actively pursue the efficient use of available supplies. The act describes the contents of the urban water management plans as well as how urban water suppliers should adopt and implement the plans (California Department of Water Resources 2009). The adopted plan must be updated at least once every five years on or before December 31 in years ending in five and zero. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the DWR is ineligible to receive drought assistance from the State of California.

CCWD's latest Urban Water Management Plan (UWMP) was adopted 2005 and covered the entire CCWD service area. This included the City of Pittsburg and the Master Plan Area. The conclusions of the UWMP were utilized in the preparation of CCWD's Future Water Study. Likewise, the City of Pittsburg prepared a UWMP in 2005, including consideration of existing and projected future growth in the City. Included in the preparation of the City's UWMP was assumed mixed-use development of the Master Plan Area.

Senate Bill (SB) 610

Senate Bill (SB) 610 makes changes to the Urban Water Management Planning Act to require additional information in urban water management plans if groundwater is identified as a source available to the supplier. The information required includes a copy of any groundwater management plan adopted by the supplier, a copy of the adjudication order or decree for adjudicated basins, and if non-adjudicated, whether the basin has been identified as being over drafted or projected to be over drafted in the most current California Department of Water Resources publication on that basin. If the basin is in overdraft, that plan must include current efforts to eliminate any long-term overdraft. A key provision in SB 610 requires that any project subject to the California Environmental Quality Act (CEQA) supplied with water from a public water system be provided a specified water supply assessment, except as specified in the law (DWR, 2009).

Assembly Bill (AB) 901

Assembly Bill (AB) 901 requires urban water management plans to include information relating to the quality of existing sources of water available to an urban water supplier over given time periods and the manner in which water quality affects water management strategies and supply (California Department of Water Resources 2009).

LOCAL

City of Pittsburg General Plan

The General Plan serves as the overriding policy document for land use in the City of Pittsburg. **Table 4.11.4-4** below provides a list of all applicable water supply policies and the proposed Master Plan's consistency with those goals and policies. While this DEIR analyzes the Master Plan's consistency with the General Plan pursuant to State CEQA Guidelines Section 15125(d), the Pittsburg City Council has the responsibility for ultimately determining the proposed Master Plan's consistency with the General Plan.

TABLE 4.11.4-4
PROJECT CONSISTENCY WITH APPLICABLE GENERAL PLAN WATER SUPPLY POLICIES

General Plan Policies	Consistent with General Plan	Analysis
Goal 11-G-1 – Available water supply and distribution capacity should grow proportionally with development patterns and water usage trends. Update City's Water Master Plan to implement General Plan growth projections.	Yes	The proposed Master Plan is already within the CCWD service area, and water supply infrastructure (pipelines) are located immediately adjacent to the Master Plan area. Development of the Master Plan was anticipated in the General Plan, the Pittsburg Water System Master Plan, and the CCWD Future Water Supply Study, ensuring that both capacity and infrastructure is in place and adequate for the proposed Master Plan.
Goal 11-G-2 – Continue to implement water conservation policies to ensure adequate supplies of water in the future.	Yes	Future development under the proposed Master Plan would be required by the City to conform to conservation requirements codified in the Pittsburg Municipal Code.
Policy 11-P-7 – Ensure that new residential, commercial, and industrial development equitably shares costs associated with providing water services to areas of urban expansion within the Planning Area.	Yes	The proposed Master Plan includes an infrastructure plan and a financing plan that set out the infrastructure and costs related to serving the project with water, as well as other utilities and services. Additionally, all new developments must pay proportional fees to CCWD prior to issuance of development permits.
Policy 11-P-9 – Cooperate with Contra Costa Water District to ensure compliance with District regulations and State law for new development requiring annexation to the Contra Costa Water District service area. Cooperate with Contra Costa Water District in processing all necessary information to allow a determination if Los Vaqueros facilities can be used to service new annexation areas.	Yes	The proposed project is already within the Contra Costa Water District service area, and development of the Master Plan was expected by CCWD and included in their planning (see Existing Setting above).

Pittsburg Municipal Code

Title 13 of the Pittsburg Municipal Code provides regulation of water supply and wastewater handling in the City of Pittsburg. Section 13.18 includes specific requirements and prohibitions towards the goal of conserving water in the city.

4.11.4.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The impact analysis provided below is based on the following State CEQA Guidelines Appendix G thresholds of significance. A water service impact is considered significant if implementation of the project would:

1) Require or result in the construction of new water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

2) Have sufficient water supplies available to serve the project from exiting entitlements and resources, or are new or expanded entitlements needed?

METHODOLOGY

The analysis of potential water supply impacts is based on information gathered from the CCWD, the City of Pittsburg, and the Pittsburg/Bay Point BART Master Plan, as well as the efforts of Mark Thomas & Company, Inc., a subconsultant secured by PMC to prepare the infrastructure needs and supply requirements of the Master Plan (see **Appendix H**). The WSA completed for the proposed Master Plan is also included in **Appendix H**.

PROJECT IMPACTS AND MITIGATION MEASURES

The following discussion of impacts and mitigation measures is based on the standards of significance above, recent environmental documents, and planning documents in and around the project area.

Environmental Impacts of Water Provision

Impact 4.11.4.1 The proposed Master Plan would require water service for the development expected in the Master Plan area. This water would be sourced from existing ground and surface sources, representing a **less than significant** impact.

As described in the CCWD Future Water Supply Study, the CCWD UWMP, and the Pittsburg Water System Master Plan, approximately 85 to 95 percent of water provided to the Master Plan area would be raw water provided to the City's water treatment plant by CCWD via the Contra Costa Canal. The remaining 5 to 15 percent of water would be supplied from the City's two existing groundwater wells.

The ability of existing water supplies to meet the needs of the proposed project is discussed in Impact 4.11.4.2 below. In regard to potential environmental impacts that could result from the use of CCWD water, these impacts were addressed in the Future Water Supply Implementation EIR, FWS-EIR (State Clearinghouse #97072064), prepared for CCWD (2001). The FWS-EIR was prepared as a tiered document from the Contra Costa County General Plan EIR, in which the Future Water Supply Study's potential environmental impacts were compared to the findings of the County General Plan EIR. The FWS-EIR found significant and unavoidable impacts in the following areas:

- Agricultural Resources – loss of agricultural land and conversion of land with prime agricultural soils

- Transportation and Traffic – increases in traffic that would result in unacceptable level of service at some intersections;

- Air Quality – growth and development which would result in significant amounts of air pollutants; and

- Aesthetics – overall change in visual character due to growth and development.

In all cases, the identified impacts of the FWS-EIR were found to result from indirect inducement of growth (i.e., more water indirectly induces growth if it serves areas not currently served with adequate supply to accommodate growth) not any specific feature or recommendation of the Future Water Supply Study. The significant and unavoidable impacts of the Future Water Supply Study were found to be consistent with significant and unavoidable impacts identified in the County General Plan EIR.

In addition, the potential environmental impacts of the Pittsburg Water System Master Plan were considered by the City during the approval process for that plan. According to City resolution 10-11546 and attached materials, a Negative Declaration was filed by the City for the Water System Master Plan, finding no significant impact from the plan. As the proposed Master Plan would be served by water supplies from both CCWD and the City of Pittsburg, and as the environmental impacts of those water supplies have been analyzed and identified in prior CEQA documentation, no additional analysis is required.

Direct water conveyance required for development in the Master Plan Area has been determined as part of the Master Plan itself. According to the findings of Mark Thomas & Company, Inc. (**Appendix H**) and as described in the proposed Master Plan, the Master Plan Area can be served with water supply by connecting to existing lines under West Leland Road and a supply line already installed within the BART parcel, currently supplying water to the station and station appurtenances. As such, any environmental impacts from direct water infrastructure is limited to the project area itself and the impacts of constructing those new pipelines and connections are discussed in aggregate in the technical sections of this DEIR (Sections 4.1 through 4.13).

As the environmental effects of serving water to the Master Plan Area have been addressed in previous EIRs and has the physical effects of water provision on-site have been addressed in this EIR, the proposed Master Plan is expected to have a **less than significant** impact.

Mitigation Measures

None required.

Adequate Water Supply to Meet Demand

Impact 4.11.4.2 The proposed Master Plan would be expected to result in development of new residential and commercial uses in the City of Pittsburg water service area, which would require provision of additional water. As this growth was anticipated by the City and was found adequate by a Water Supply Assessment, this impact would be **less than significant**.

As discussed in Section 4.0, Assumptions, the proposed Master Plan is expected to result in the development of 1,168 multi-family dwelling units and approximately 146,362 square feet of nonresidential development. These additional units and nonresidential square feet of development would require provision of water for the use of residents and employees as well as for specific nonresidential uses. In order to estimate the quantity of water required to serve the uses of the Master Plan, Mark Thomas & Company, Inc. (2011) undertook an analysis of projected uses and their water needs (see **Appendix H**). Demand rates were determined according to standard criteria utilized by the City and CCWD and the requirements of CCWD and then applied to each land use. Residential uses were anticipated to require 340 gallons per day (gpd) per multi-family dwelling unit. Nonresidential uses were anticipated to require 2,000 gpd per acre of nonresidential land use, except for the on-site park, which is expected to require 2,500 gpd. The anticipated average water usage per day of the proposed Master Plan is shown in **Table 4.11.4-5** below.

TABLE 4.11.4-5
ANTICIPATED WATER DEMAND OF THE PROPOSED MASTER PLAN

Phase/Property	Water Demand (gpd)
Phase 1/BART	38,540
Phase 2/BART	360
Phase 3/BART	53,040
Phase 4/BART	20,180
Phase 5/BART	40,420
WCHB	254,320
TOTAL	**406,860**

As shown in **Table 4.11.4-3**, the proposed Master Plan is expected to require 406,860 gallons per day at buildout. When extrapolated to a year's demand, the Master Plan would require approximately 148.6 million gallons a year (mgy). With approximately 325,851.4 gallons in an acre-foot (AF), the Master Plan would require approximately 456.1 AF per year, or approximately 3.8 percent of the annual expected demand in Pittsburg in 2010.

A Water Supply Assessment (WSA) consistent with the requirements of SB610 (see Regulatory Setting above) was prepared by the City – the water provider for the Master Plan Area –and was approved by the City Council on May 16, 2011 (see **Appendix H**). This WSA found that water supplies were adequate to serve the proposed Master Plan.

Water demand analyses provided in the CCWD Future Water Supply Study and the Pittsburg Water System Master Plan anticipated growth according to local plans and the expectations of the City. As described in the General Plan, the Master Plan area was expected to generate a much higher density of development than was actually anticipated in both the General Plan and the Pittsburg Water System Master Plan. The General Plan anticipated approximately 65 dwelling units per acre, whereas the Master Plan is expected to generate approximately 23.1 units per acre (see Section 4.1, Land Use and Planning). Likewise, the Pittsburg Water System Master Plan anticipated the development of 1,550 dwelling units in the Master Plan Area, where the Master Plan is now anticipated to contain 1,168 dwelling units. The conclusions of both the CCWD Future Water Supply Study and the Pittsburg Water System Master Plan were identical, in that future supplies of water would be adequate and only minor infrastructure improvements in the city (namely installation of two additional tanks – see Impact 4.11.4.3 below). The environmental impacts of providing additional water to the City of Pittsburg were considered as part of approval of the Water System Master Plan; no significant impacts were identified (City of

Pittsburg 2010). Likewise, CCWD and the County of Contra Costa considered the environmental impacts of water supply growth in the CCWD service area in the Future Water Supply Implementation EIR (State Clearinghouse #97072064). As such, the proposed Master Plan is anticipated to be served with adequate water supplies to meet the expected demand of 456.1 AF per year, and a **less than significant** impact is expected.

Mitigation Measures

None required.

4.11.4.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The cumulative setting for water supply is considered to be the service area of the City of Pittsburg and the greater CCWD service area, as CCWD provides the majority of water supplied in the city (though that water is then treated by the City prior to delivery to water customers). Growth projections and water demand in the cumulative setting was determined according to the latest Future Water Supply Study prepared by CCWD.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Water Supply Impacts

Impact 4.11.4.3 Implementation of the proposed Master Plan, in combination with cumulative development in the City of Pittsburg, would increase the current demand for CCWD water supply. This increase in demand was anticipated by both CCWD and the City of Pittsburg, resulting in a **less than cumulatively considerable** impact.

The water demands of the proposed project, in combination with existing and projected development within the CCWD service area, were considered in the CCWD Future Water Supply Study. Likewise, the City considered the proposed project and other existing and projected future development in the City's service area. In both cases, assumptions for the development expected of the Master Plan area were greater than that actually expected according to the assumptions presented in Section 4.0, Assumptions. There are currently plans for the City to build six reservoirs throughout the City. In 2009, a new three million gallon water tank was constructed along West Leland Road in the vicinity of the Master Plan area to serve Zone 2, in which the project area is located (Pease, 2011). With the newly built and operational water tank, there is adequate capacity to serve the proposed project.

In regard to the environmental effects of water supplies for the CCWD service area, any potential impact have been addressed by CCWD and the County of Contra Costa in the Future Water Supply Infrastructure EIR (see discussion under Impact 4.11.4.1 above).

While the provision of adequate supplies to the cumulative setting area would have significant impacts, as identified in the FWS-EIR (see Impact 4.11.4.1 above), the proposed project was considered in the analysis presented in that EIR as well as in the environmental analysis presented by the City in the Negative Declaration for the Water System Master Plan (2010). As the proposed project was anticipated in planning and analysis of the cumulative water supply situation and as the proposed project would conform with the assumptions in those documents for the Master Plan area, the proposed Master Plan's contribution to cumulative water supply impacts is expected to be **less than cumulatively considerable**.

Mitigation Measures

None required.

4.11.5 WASTEWATER SERVICES

4.11.5.1 EXISTING SETTING

Sanitary sewer service in the Master Plan area is provided by the Delta Diablo Sanitation District (DDSD) and the City of Pittsburg. DDSD owns and operates the system that collects, conveys, and treats wastewater for the Bay Point area and treats wastewater for the City of Pittsburg. The City maintains and owns its local sewage collection system and is responsible for the collection and conveyance of wastewater to DDSD's treatment plant.

The DDSD treatment plant is located north of State Route (SR) 4, just east of the City of Pittsburg city limits. Existing DDSD wastewater treatment facilities have a capacity of 16.5 mgd. In 2006, DDSD treated an average of 14.6 mgd. The treated effluent is discharged to New York Slough and the Sacramento-San Joaquin Delta. The treated effluent is regulated under the National Pollutant Discharge Elimination System (NPDES) permit system, which is administered under the auspices of the Environmental Protection Agency (EPA).

DDSD has adopted a District Master Plan that includes a phased treatment plant expansion to ultimately provide 24 mgd capacity (average dry weather flow) in order to accommodate anticipated growth in the City of Pittsburg, City of Antioch, and unincorporated Bay Point (City of Pittsburg 2009b). This anticipated growth included the proposed Master Plan at a more intense development scale than is proposed by the Master Plan (see Section 4.1, Land Use and Planning).

The City's 2005 Water and Sewer Facility Reserve Charges study indicates that in some areas, new development will connect to the existing wastewater infrastructure, while in other areas, new infrastructure will need to be built. The City has planned for wastewater infrastructure needs through updated system master plans, the annual budget, rate structures, and the five-year Capital Improvement Program that includes an annual water main/service/valve replacement program and wastewater pipeline CCTV inspection program to extend the life of the infrastructure (Contra Costa County 2008).

RECYCLED WATER

DDSD Recycled Water Facility (RWF) provides tertiary treatment in the process of reclaiming wastewater for use in cooling at power plants and landscape irrigation at several parks in Pittsburg. The RWF provides up to 8,600 acre-feet per year of tertiary treated water for use at two power plants and for irrigation at the Delta View Golf Course, Stoneman Park, and City Park in Pittsburg. The Pittsburg Recycled Water Project included the construction of 2.5 miles of piping, a pump station, and 1 million gallon recycled water tank at the golf course to deliver recycled water to select parks within the City of Pittsburg to offset irrigation demands for potable water (City of Pittsburg 2009b).

4.11.5.2 REGULATORY FRAMEWORK

FEDERAL

Clean Water Act

The Clean Water Act (CWA) is the primary federal legislation governing surface water quality protection. The statute employs a variety of regulatory and non-regulatory tools to sharply reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. These tools are employed to achieve the broader goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters so that they can support the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water. Pollutants regulated under the CWA include "priority" pollutants, including various toxic pollutants; "conventional" pollutants, such as biochemical oxygen demand, total suspended solids, fecal coliform, oil and grease, and pH; and "non-conventional" pollutants, including any pollutant not identified as either conventional or priority. The CWA regulates both direct and indirect discharges (EPA 2011).

LOCAL

City of Pittsburg General Plan

The City of Pittsburg 2020 General Plan Public Facilities Element includes goals and policies related to wastewater. **Table 4.11.5-1** analyzes the project's consistency with applicable City of Pittsburg General Plan policies. While this DEIR analyzes the project's consistency with the City of Pittsburg General Plan pursuant to CEQA Section 15125(d), the Pittsburg City Council has the responsibility for ultimately determining the proposed Master Plan's consistency with the General Plan. Environmental impacts associated with inconsistency with General Plan policies are addressed under the appropriate impact discussion sections of this DEIR.

TABLE 4.11.5-1
PROJECT CONSISTENCY WITH APPLICABLE GENERAL PLAN WASTEWATER POLICIES

General Plan Policies	Consistent with General Plan	Analysis
Policy 11-P-15 – Work with Delta Diablo Sanitation District to promote the use of recycled water for irrigation of large planted areas, such as business/industrial campus projects, City parks, and street medians.	Yes	The Master Plan includes a provision promoting the use of recycled water for nonresidential development in the Master Plan area.
Policy 11-P-18 – Ensure that new residential, commercial, and industrial development equitably share costs associated with providing wastewater services to areas of urban expansion within the Planning Area.	Yes	The residential and retail portions of the proposed Master Plan will pay all required development fees and costs associated with wastewater service provision.

4.11.5.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The impact analysis provided below is based on the following State CEQA Guidelines Appendix G thresholds of significance. A wastewater service impact is considered significant if implementation of the project would:

1) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.

2) Require or result in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

3) Result in a determination by the wastewater treatment provider which serves or may serve the project that is has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

METHODOLOGY

The analysis of potential wastewater service impacts is based on information provided by the City of Pittsburg and Delta Diablo Sanitary District. As discussed in Section 4.0, Assumptions, the proposed Master Plan is expected to result in 1,168 residential units, 1,300 employees, and 146,362 acres of nonresidential development. Using a rate of 3.20 persons per household, as discussed in Section 4.2, Population, Housing, and Employment, the project would result in a population of 3,738 new residents. Mark Thomas & Company, Inc., a consulting firm secured by PMC for development of infrastructure requirements for the proposed Master Plan, projects that wastewater demand associated with the proposed development would generate 207,886 gallons of wastewater per day (see **Appendix I**).

PROJECT IMPACTS AND MITIGATION MEASURES

Wastewater

Impact 4.11.5.1 Expected new development as a result of the Master Plan would not exceed current wastewater collection and treatment capacity. As Delta Diablo Sanitation District facilities would adequately accommodate the projected growth upon implementation of a recently approved treatment plant expansion project, this impact is **less than significant**.

Existing DDSD wastewater treatment facilities have a capacity of 16.5 mgd. In 2006, DDSD treated an average of 14.6 mgd. As noted above in the Methodology section, Mark Thomas & Co. Inco, determined that the expected development of 1,168 residential units, 1,300 employees, and 146,362 acres of nonresidential development is expected to generate 207,886 gallons of wastewater per day, or 0.2 million gallons a day (mgd). Currently, DDSD has excess treatment capacity of approximately 1.9 mgd (16.5 mdg capacity – 14.6 mgd average treatment) with plans to expand to approximately 24 mgd prior to buildout of the Master Plan. As such, project increases can be accommodated within the existing system. However, as large areas of the Master Plan Area do not currently contain collection pipes, and as pipes under the BART parcels are undersized for a project of the size of the proposed Master Plan, several individual wastewater pipes would need to be upgraded or installed to provide hook-ups for the new development areas. While this additional infrastructure is required, existing infrastructure under Bailey Road and West Leland Road would be tied into the Master Plan area, limiting impacts to the Master Plan area and immediately adjacent properties. Furthermore, installation of a 12-inch collection pipeline along the south side of SR 4 would be required, within the PG&E easement. Physical impacts of these various connections are addressed in the representative sections of this DEIR.

Further assurance that adequate capacity will exist at the time of development is granted by the fact that the City of Pittsburg enforces General Plan policies that would require adequate wastewater treatment capacity for planned development prior to approval. Under Sewer Policies 3-G-7 and 3-S-13, the City of Pittsburg would maintain an adequate sewer collection and treatment system to serve proposed development projects. Additionally, the General Plan presents policies to promote treatment plant expansion, infrastructure improvements, and use of reclaimed water, all of which would benefit the wastewater collection and treatment capacity for the City of Pittsburg. These policies work by ensuring the expansion of the wastewater treatment plant as needed and promoting the use of recycled water for irrigation of large planted areas.

Given the current wastewater collection and treatment capacity provided by DDSD, the proposed Master Plan development would have **less than significant** impacts on current wastewater collection and treatment capacity.

Mitigation Measures

None required.

4.11.5.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The cumulative analysis for the Master Plan area encompasses the service area covered by DDSD. The geographic area within east Contra Costa County provides a context within which to examine potential cumulative resource impacts on utility services that may result from the proposed Master Plan in combination with other reasonably foreseeable development. Other foreseeable development would include the growth anticipated by the City of Pittsburg General Plan, the Specific Plans that the cities of Pittsburg and Antioch are preparing around the proposed station areas and the Pittsburg/Bay Point BART Station Area Specific Plan.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Wastewater Impacts

Impact 4.11.5.2 Implementation of the proposed Master Plan, in combination with foreseeable development in the area, would not result in a cumulative demand for wastewater treatment capacity that could require additional wastewater facilities. This would be a **less than cumulatively considerable** impact.

The projected residential and commercial development in the Master Plan area and in the DDSD service area would increase demand for wastewater treatment that could potentially affect existing capacity of wastewater treatment facilities. Impact 4.11.5.1 found that the proposed Master Plan would have a less than significant impact on wastewater capacity on its own. Furthermore, the City of Pittsburg Sewer Master Plan and General Plan have anticipated development on Master Plan area, and the development proposed by the Master Plan is less intense than that assumed in the General Plan. However, cumulative development in the region, along with the proposed project, would require additional capacity at the treatment plant. DDSD recently adopted a District Master Plan that includes phased treatment plant expansion to ultimately provide 24 mgd capacity (average dry weather flow) in order to accommodate anticipated growth in the City of Pittsburg, City of Antioch, and unincorporated Bay Point. This anticipated growth would include proposed new development under the proposed Master Plan. According to DDSD, the expansion of the DDSD treatment plant would cost approximately $127 million. This expansion would accommodate the new development proposed in the Master Plan, as well as substantial land annexations and development expected for the various cities served by DDSD. The proposed Master Plan's anticipated wastewater demands would be a small percentage of the total anticipated wastewater demands resulting from new development in the region and would not constitute a substantial impact on DDSD's currently anticipated wastewater processing capacity. Furthermore, the City of Pittsburg is able to accommodate a total dry weather flow of uses identified in the General Plan. Also, the City has planned wastewater infrastructure improvement projects to correct deficiencies in the system under General Plan buildout conditions (Contra Costa LAFCO 2007).

The Association of Bay Area Governments (ABAG) forecasts that 14,850 new households will be added to the City of Pittsburg between 2005 and 2030. The 1,168 new households proposed under the Master Plan represent 7.9 percent of that total and would therefore not constitute a substantial portion of the total cumulative development anticipated before 2030. Likewise, the proposed Master Plan's impact on wastewater would not be a substantial portion of total cumulative demand, compared with the anticipated construction of 14,850 new households between 2005 and 2030. As stated above, the City and DDSD are implementing actions to accommodate this cumulative growth, including growth created by the proposed Master Plan.

Construction of new wastewater facilities would result in environmental impacts, including short-term effects associated with construction such as air quality, noise, erosion, water quality, biological resources, and cultural resources effects. However, these facilities are independent of the proposed Master Plan and are not necessary to provide service to the proposed Master Plan area. Environmental effects of expanded wastewater facilities would be analyzed on a case-by-case basis as design, upgrade, and modification details become available.

While the City of Pittsburg may experience potentially significant cumulative impacts to the wastewater treatment system, the proposed project's contribution to this impact would not result in the need for new or expanded wastewater treatment facilities and would not exceed the capacity of the existing wastewater treatment facility. The proposed project would generate less than 1 percent of the total volume of wastewater treated at the DDSD treatment facilities under cumulative conditions. Based on the factors identified above, this impact is considered to be **less than cumulatively considerable**.

Mitigation Measures

None required.

4.11.6 SOLID WASTE DISPOSAL

4.11.6.1 EXISTING SETTING

Solid waste pickup and disposal for the City of Pittsburg and a small portion of Bay Point is provided by Pittsburg Disposal Services. Residential and commercial solid waste is disposed at Potrero Hills Landfill, located east of Suisun City. Non-recyclable industrial waste is transported to Keller Canyon Landfill, located southeast of the Pittsburg city limits. These landfills have replaced the Contra Costa Sanitary Landfill.

LANDFILLS

Potrero Hills Landfill is a regional waste disposal facility that primarily serves the central portion of Solano County and a number of surrounding counties through contracts with private haulers, including Contra Costa County and the City of Pittsburg. A Class III landfill, Potrero Hills has approximately 64.5 percent of its 21.5 million cubic yards of capacity remaining. The landfill has a daily permitted capacity of 4,330 tons per day. Potrero Hills Landfill Company owns adjacent acreage that will be added to the existing facility as expansion becomes necessary. In 1996, 53 percent (194,157 tons) of waste disposed at Potrero Hills Landfill originated from the Contra Costa Recycling Center and Transfer Station located in Pittsburg. Approximately 62,010 tons (32 percent) of this amount originated from Pittsburg.

Keller Canyon Landfill is a wholly owned subsidiary of Allied Waste Industries. The Keller Canyon Landfill opened on May 7, 1992, as a Class II Landfill operating under permit number 07-AA-0032. The facility accepts municipal solid waste, non-liquid industrial waste, contaminated soils, ash, grit, and sludges. Keller Canyon Landfill covers 2,600 acres of land; 244 acres are permitted for disposal. The site currently handles 2,500 tons of waste per day, although the permit allows up to 3,500 tons of waste per day to be managed at the facility. In 2005, the City of Pittsburg residential daily disposal was 3.1 pounds per residents per day. Comparatively, in 2001 the daily disposal was 2.7 and in 2003, 2.6 pounds.

RECYCLING AND WASTE REDUCTION

A voluntary curbside recycling program is in place in the City of Pittsburg. The program is operated by Pittsburg Disposal Services. Materials accepted for recycling include plastic, glass, aluminum, tin, newspaper, white and colored paper, magazines, and cardboard. Recyclables are picked up once a week along with regular waste and then processed at the Mount Diablo Recycling Facility, a facility owned by Pittsburg Disposal Services. In addition, yard waste collection services are provided every other week. The City of Pittsburg has met the required diversion rates established by the California Integrated Waste Management Board, now known as CalRecycle (City of Pittsburg, 2001. In 1989, California passed Assembly Bill 939 (AB 939), also known as the California Integrated Waste Management Act, which requires each city and county, to not only develop a source reduction and recycling plan, but to reach a 50 percent diversion rate by January 1, 2000. The overall diversion rate for the City of Pittsburg in 2006 was 54 percent.

4.11.6.2 REGULATORY FRAMEWORK

FEDERAL

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) was enacted in 1976 to address the huge volumes of municipal and industrial solid waste generated nationwide. After several amendments, the act as it stands today governs the management of solid and hazardous waste and underground storage tanks. The RCRA, enacted in 1976, is an amendment to the Solid Waste Disposal Act of 1965. The RCRA has been amended several times, most significantly by the Hazardous and Solid Waste Amendments of 1984. The RCRA is a combination of the first solid waste statutes and all subsequent amendments. The act authorizes the EPA to regulate waste management activities and authorizes states to develop and enforce their own waste management programs, in lieu of the federal program, if a state's waste management program is substantially equivalent to, consistent with, and no less stringent than the federal program.

STATE

California Integrated Waste Management Act (AB 939)

The California Integrated Waste Management Act of 1989 (AB 939) requires every city and county in the state to prepare a Solid Reduction and Recycling Element (SRRE) to its Solid Waste Management Plan that identifies how each jurisdiction will meet the mandatory state waste diversion goals of 25 percent by 1995 and 50 percent by 2000. The purpose of AB 939 is to reduce, recycle, and re-use solid waste generated in the state to the maximum extent feasible.

The term "integrated waste management" refers to the use of a variety of waste management practices to safely and effectively handle the municipal solid waste stream with the least adverse impact on human health and the environment. The act has established a waste management hierarchy, as follows:

1) Source Reduction

2) Recycling

3) Composting

4) Transformation

5) Disposal

California Integrated Waste Management Board Model Ordinance

Subsequent to the Integrated Waste Management Act, additional legislation was passed to assist local jurisdictions in accomplishing the goals of AB 939. The California Solid Waste Re-use and Recycling Access Act of 1991 (Sections 42900–42911 of the Public Resources Code) required the California Integrated Waste Management Board (CIWMB)2 to approve a model ordinance

[2] Note: CIWMB is now known as CalRecyle.

for adoption by any local government for the transfer, receipt, storage, and loading of recyclable materials in development projects by March 1, 1993. The act also required local agencies to adopt a local ordinance by September 1, 1993, or to allow the model ordinance to take effect.

Per Capita Disposal Measurement System (SB 1016)

SB 1016 was passed into law in late 2008 and is intended to make the process of goal measurement as established by the Integrated Waste Management Act of 1989 (AB 939) simpler, timelier, and more accurate. SB 1016 builds on AB 939 compliance requirements by implementing a simplified measure of jurisdictions' performance. SB 1016 accomplishes this by changing to a disposal-based indicator—the per capita disposal rate—which uses only two factors: a jurisdiction's population (or in some cases employment) and its disposal as reported by disposal facilities. SB 1016 shifts from the historical emphasis on using calculated generation and estimated diversion to using annual disposal as a factor when evaluating jurisdictions' program implementation (CalRecycle 2011a).

LOCAL

Countywide Integrated Waste Management Plan

Contra Costa County has adopted a Countywide Integrated Waste Management Plan (IWMP) and a Source Reduction and Recycling Element (SRRE) as required by the California Integrated Waste Management Act. The Countywide IWMP establishes the County's waste management goals, objectives, and policies related to solid waste facility siting, household hazardous waste collection and disposal, and programs designed for plan implementation. The SRRE establishes policies and goals for source reduction, recycling, composting, special waste, public information and education, and programs to help the County achieve these goals.

City of Pittsburg SRRE

The City of Pittsburg has ongoing programs to implement various policies established in the Countywide IWMP. The City adopted an SRRE in 1992 that includes short- and medium-term recycling objectives. The City operates a voluntary curbside recycling program operated by Pittsburg Disposal and in July 1996 began operation of the East County Community Collection Center within the Delta Diablo Sanitation District.

Recyclable Waste Material Collection Ordinance

The City of Pittsburg administers a recyclable waste material collection ordinance, Chapter 806 of the Municipal Code. The ordinance contains requirements for residential curbside recycling programs and recycling at nonresidential establishments. The City requires that new developments comply with applicable ordinance requirements as a matter of course.

City of Pittsburg General Plan

The City of Pittsburg 2020 General Plan Public Facilities Element includes goals and policies related to solid waste. **Table 4.11.6-1** analyzes the proposed project's consistency with applicable City of Pittsburg General Plan policies. While this DEIR analyzes the project's consistency with the City of Pittsburg General Plan pursuant to CEQA Section 15125(d), the Pittsburg City Council has the responsibility for ultimately determining the proposed Master Plan's consistency with the General Plan. Environmental impacts associated with inconsistency with

General Plan policies are addressed under the appropriate impact discussion sections of this DEIR.

TABLE 4.11.6-1
PROJECT CONSISTENCY WITH APPLICABLE GENERAL PLAN SOLID WASTE POLICIES

General Plan Policies	Consistent with General Plan	Analysis
Policy 11-P-20 – Work with Pittsburg Disposal Services to increase participation in curbside recycling programs for residential neighborhoods.	Yes	Residential development under the proposed Master Plan has the option to participate in the City's voluntary curbside recycling program.
Policy 11-P-23 – Encourage builders to incorporate interior and exterior storage areas for recyclables into new or remodeled residential, commercial, and industrial structures.	Undetermined	Specific development details for the proposed Master Plan have not been developed. Nor does the proposed project include any specific development proposals. As such, the consistency of land uses in the Master Plan area with this policy cannot be determined. The Master Plan includes Development Standards and Design Guidelines that require provision of recyclable areas within trash enclosures.

4.11.6.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The impact analysis provided below is based on the following State CEQA Guidelines Appendix G thresholds of significance. A solid waste impact is considered significant if implementation of the project would:

1) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs.

2) Comply with federal, state, and local statutes and regulations related to solid waste.

METHODOLOGY

This analysis is based on review of applicable plans and consultation with solid waste service providers. As discussed in Section 4.0, Assumptions, of this DEIR, the proposed Master Plan is expected to result in 1,168 residential units, 1,300 employees, and 146,362 acres of nonresidential development. Using a rate of 3.20 persons per household, as discussed in Section 4.2, Population, Housing, and Employment, the project would result in a population of 3,738 new residents. Using a rate of 12.23 pounds of solid waste per household per day and 10.53 pounds of solid waste per commercial employee per day (CalRecycle 2011b), the proposed Master Plan would be expected to generate 30.4 tons of waste per day.

PROJECT IMPACTS AND MITIGATION MEASURES

Solid Waste Disposal Services

Impact 4.11.6.1 Proposed Master Plan development could impact solid waste collection services and landfill capacity. This impact is considered **less than significant**.

In 2005, the City of Pittsburg generated approximately 84,935 tons of waste. Of the 84,935 tons, 45,016 tons was household waste and the remaining was business waste. Household waste materials include organics, paper, plastics, metals, construction and demolition debris, glass, mixed residue, household hazardous waste, and special waste. The remaining waste was categorized as business waste material, which, similar to household waste materials, included paper, metal, glass, plastic, organic, construction and demolition debris, hazardous waste, and mixed residue.

The City of Pittsburg, as noted above, disposes of solid waste at Potrero Hills Landfill and Keller Canyon Landfill. Keller Canyon Landfill currently handles 2,500 tons of waste per day, although their existing permit allows for up to 3,500 tons of waste per day to be managed at the facility. The Potrero Hills Landfill has a daily permitted capacity of 4,330 tons per day. No information is currently available regarding how much actual waste Potrero Landfill handles daily.

As noted in the Methodology subsection above, increased development assumed under the proposed Master Plan would be expected to generate solid waste at a rate of 30.4 tons of waste per day. This increase in daily waste flow would not significantly impact the daily capacities of the Potrero Hills or Keller Canyon landfills, which collectively have at least 1,000 tons of waste per day in capacity remaining. Additionally, the Pittsburg General Plan includes policies that guide and promote waste reduction (as described above in **Table 4.11.6-1**). The current permitted capacity at the two landfills, in addition to compliance with the policies set forth in the General Plan, would ensure that impacts related to available disposal capacity are **less than significant**.

<u>Mitigation Measures</u>

None required.

4.11.6.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The cumulative setting for solid waste includes the service area boundaries of Pittsburg Disposal Services, which is responsible for maintaining solid waste management systems for residents and businesses in the City of Pittsburg. The cumulative setting includes all existing, planned, proposed, approved, and reasonably foreseeable development within the above service areas that currently place demand on the Potrero Hills and Keller Canyon landfills.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Solid Waste Impacts

Impact 4.11.6.2 The proposed project would contribute to cumulative demands for solid waste disposal services. This would be a **less than cumulatively considerable** contribution to the cumulative impact.

As discussed above, the proposed project would have no individually significant impacts on solid waste. The proposed project would add a maximum of 1,168 new households to the City of Pittsburg. ABAG forecasts that 14,850 new households will be added to the City of Pittsburg between 2005 and 2030, representing approximately 90 tpd of solid waste. The 1,168 new households proposed under the proposed Master Plan represent 7.9 percent of ABAG forecasts and would therefore not constitute a substantial portion of the total cumulative development anticipated before 2030. Furthermore, development assumed in local planning, including under the Pittsburg General Plan, for the Master Plan area assumed a higher intensity of development than is actually expected of the proposed Master Plan (see Section 4.0 and Section 4.1). As such, the proposed Master Plan's impact on solid waste would not be a substantial portion of total cumulative demand, compared with the anticipated construction of 14,850 new households between 2005 and 2030.

Pittsburg Disposal Services collects Pittsburg's solid waste and ultimately disposes of it at the Potrero Hills and Keller Canyon landfills. The Keller Canyon Landfill alone has excess handling capacity of approximately 1,000 tpd. Even if the waste generated by ABAG forecasted growth is doubled to 180 tpd to account for increases in employees in the City, projected growth would only represent approximately 18 percent of total capacity. That does not consider the Potrero Hills landfill, which would handle some of that waste. As existing intake was not available for Potrero Hills, excess capacity for that facility could not be determined.

Implementation of the proposed Master Plan, in combination with other proposed projects and projected growth, would result in a cumulative increase in waste generation. However, this increase could be accommodated by the existing landfills. Furthermore, Pittsburg is currently meeting the source reduction requirements of AB 939 and will continue to implement the Source Reduction and Recycling Element (SRRE), which would ensure continued compliance with AB 939 under the proposed Master Plan and continue to reduce the overall solid waste generated by the Master Plan Area. Also, continued implementation of the General Plan policies listed in **Table 4.11.6-1** above would further reduce the amount of solid waste generated by the Master Plan. In consideration of this and the existing excess landfill capacity, a **less than cumulatively considerable** impact would occur.

Mitigation Measures

None required.

4.11.7 ELECTRICAL, NATURAL GAS, TELEPHONE, AND CABLE SERVICES

4.11.7.1 EXISTING SETTING

ELECTRIC SERVICE

Pacific Gas and Electric (PG&E) is the main provider of electricity to Contra Costa County. PG&E obtains its energy supplies from power plants and natural gas fields in northern California and from energy purchased outside its service area and delivered through high voltage transmission lines and pipelines. The PG&E utility system in the Master Plan area consists of transmission lines rated at 21 kilovolts (kV) and 60 kV, supported by wooden poles. PG&E utilities in the vicinity include overhead power lines and a substation located west of the Master Plan area in the PG&E power line easement corridor that bisects the City of Pittsburg from the Mirant Power Plant to the hillside in the southern part of the city.

NATURAL GAS

Chevron Pipeline Company, CPN Pipeline Company, and PG&E own and operate oil and gas pipelines within the Master Plan area. Gas lines range from 4 inches to 34 inches in diameter and are encased in concrete and/or other protective covering.

CABLE AND TELEPHONE

Cable and telephone utilities in the project area are owned and operated by Comcast and AT&T. These communications lines serve, and physically bisect, the Master Plan area.

4.11.7.2 REGULATORY FRAMEWORK

STATE

California Public Utilities Commission

The California Public Utilities Commission (CPUC) is the state agency that regulates privately owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies, in addition to authorizing video franchises. The CPUC grants operating authority, regulates service standards, sets rates, and monitors utility operations for safety, environmental stewardship, and public interest.

Traditionally, general rate cases have been the major form of regulatory proceeding for the CPUC. General rate case applications may be filed every three years and take about a year to complete. The utility bases its revenue request on its estimated operating costs and revenue needs for a particular future year. Customer rates will be based on the CPUC's determination of how much revenue the utility reasonably requires to operate.

California Building Energy Efficiency Standards

Title 24, Part 6 of the California Code of Regulations, known as the Building Energy Efficiency Standards, was established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The Energy Commission adopted the 2008 standards on April 23, 2008, and the Building Standards

Commission approved them for publication on September 11, 2008. The new standards went into effect on July 1, 2009 (CEC 2008).

CEQA Appendix F

In order to assure that energy implications are considered in project decisions, the California Environmental Quality Act (CEQA) requires that environmental impact reports (EIRs) include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy. Appendix F of the CEQA Guidelines, which is designed to assist in the preparation of an EIR, lists energy impact possibilities and potential conservation measures.

LOCAL

City of Pittsburg General Plan

The City of Pittsburg 2020 General Plan Public Facilities Element includes goals and policies related to electrical, natural gas, cable and telephone services. **Table 4.11.7-1** analyzes the project's consistency with applicable City of Pittsburg General Plan policies. While this DEIR analyzes the project's consistency with the City of Pittsburg General Plan pursuant to CEQA Section 15125(d), the Pittsburg City Council has the responsibility for ultimately determining the proposed Master Plan's consistency with the General Plan. Environmental impacts associated with inconsistency with General Plan policies are addressed under the appropriate impact discussion sections of this DEIR.

TABLE 4.11.7-1
PROJECT CONSISTENCY WITH APPLICABLE GENERAL PLAN UTILITIES POLICIES

General Plan Policies	Consistent with General Plan	Analysis
Policy 11-P-32 – Ensure the designation of service corridor easements or routes when required for tentative map or specific plan approval.	Yes	Service corridor easements have been identified as part of the proposed Master Plan.
Policy 11-P-33 – As a Condition of Approval, ensure that all new and redevelopment projects underground utility lines on and adjacent to the site.	Yes	All utility lines associated with the proposed Master Plan will be undergrounded.

4.11.7.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

The impact analysis provided below is based on the following State CEQA Guidelines Appendix G thresholds of significance. An electricity, natural gas, telephone, or cable television service impact is considered significant if implementation of the project would:

1) Result in a substantial adverse physical impact associated with the provision of new or physically altered facilities, need for new or physically altered facilities, the construction

of which could cause significant environmental impacts in order to maintain acceptable service.

Furthermore, a public services or utilities impact is considered significant if implementation of the project would result in inefficient, wasteful, and unnecessary consumption of energy (based on State CEQA Guidelines Appendix F).

METHODOLOGY

This analysis is based upon review of facilities in the project and consultations with electric, natural gas, and telecommunication service providers. As discussed in Section 4.0, Assumptions, the proposed Master Plan is expected to result in 1,168 residential units, 1,300 employees, and 146,362 acres of nonresidential development. Using a rate of 3.20 persons per household, as discussed in Section 4.2, Population, Housing, and Employment, the project would result in a population of 3,738 new residents.

PROJECT IMPACTS AND MITIGATION MEASURES

Impacts to Electrical, Natural Gas, and Telecommunication Services

Impact 4.11.7.1 Implementation of the proposed Master Plan would require additional electric and natural gas supplies, along with conveyance facilities for these and telephone and cable television services. This impact is considered **less than significant**.

Implementation of the proposed Master Plan would result in a greater demand for electricity, natural gas, and telecommunication services. This increase in demand will result in a need for additional facilities and infrastructure to provide service to subsequent development.

PG&E provides electrical and natural gas service to the city and would serve subsequent development projects under the Master Plan area. PG&E is required by the California Public Utilities Commission to update the existing systems to meet any additional demand. PG&E builds new infrastructure on an as-needed basis. All off-site electrical and natural gas distribution lines, substations, transmission lines, delivery facilities, and easements required to serve the proposed Master Plan area would be subject to CEQA review, typically as part of larger development proposals brought before the City.. However, it is expected that much of the distribution infrastructure would be collocated with other utilities underground within roadway right-of-way and would minimize the extent of environmental effects. Natural gas lines of 3/4 inch, 1 inch, 2 inches, and 6 inches currently exist to the east of the Master Plan area, along Bailey Road, and a 4-inch pipe exists on the south of the Master Plan area along West Leland Road. Natural gas to the Master Plan area would be tied into these existing pipelines. The physical effects of these tie-ins are addressed in aggregate in the various technical sections of this EIR.

Potential environmental effects of obtaining more power through the development of power plants include, but are not limited to, air quality, biological resources, cultural resources (depending on location), hazardous materials, land use, noise and vibration, traffic, visual resources, waste management, water and soil resources, and health hazards. Potential environmental effects for the construction of transmission lines include, but are not limited to, air quality (during construction), biological resources (depending on location), cultural resources (depending on location), hazardous materials, land use, noise and vibration (during construction), traffic, visual resources, and health hazards. All of these impacts have been described and analyzed within their respective sections within this EIR.

AT&T and Comcast provide cable, Internet, and telephone service to the city. A telecommunications conduit currently exists along the eastern portion of the Master Plan area, and multiple conduits currently border the Master Plan area's southern and eastern boundaries. Telecommunication services would be provided to the Master Plan area through these lines.

For those services identified above which are located in Bailey Road, the Master Plan anticipates that new lines would be installed under the Oak Hills Shopping Center using bore and jack methods. Bore and jack installation involves drilling under the shopping center, thus minimizing impacts to the shopping center. Typical environmental impacts of such installation are limited to potential geotechnical effects, which would be addressed as part of geotechnical analyses required in Section 4.7, Geology and Soils, of this DEIR. Other possible effects are related to the use of surfactants and lubricants, often required as a result of subsurface conditions encountered during drilling. As these materials would not be used in the vicinity of the on-site drainage basin, and as a stormwater pollution prevention plan and the incorporation of other best management practices are required as a part of construction (see Section 4.8, Hydrology and Water Quality, of this DEIR), any impact from these materials would be minimized as well.

Development under the proposed Master Plan would be required to comply with the changes to Title 24 of the California Code of Regulations regarding energy efficiency, and would be required to be 20% more efficient than Title 24 (Green Building Standards, Required Standard 2, p 5-17). These new energy efficiency standards were developed in response to the state's energy crisis to avoid the wasteful, inefficient, and unnecessary consumption of energy and to improve residential and nonresidential building energy efficiency, minimize impacts to peak energy usage periods, and reduce impacts on overall state energy needs.

The required major infrastructure for electricity, natural gas, and telecommunication services is already located in close proximity to the Master Plan area. Furthermore, development of the Master Plan area has been assumed for some time; therefore, local utilities have planned for the demand of such a project. This impact is considered **less than significant**.

Mitigation Measures

None required.

Consumption of Energy

Impact 4.11.7.2 Implementation of the proposed Master Plan would cause an increase in energy use. However, the proposed project is not designed to use energy in a wasteful manner. This impact is therefore considered **less than significant**.

As described in Section 4.0, the proposed Master Plan is expected to result in the construction of 1,168 dwelling units and approximately 146,362 square feet of non-residential development. These new units and non-residential buildings will require provision of electrical power, greater in quantity than currently used by the site, half of which is undeveloped and the remaining half of which contains BART station appurtenances. Therefore, the proposed Master Plan would consume a substantial amount of energy throughout its use. However, the proposed Master Plan is a mixed-use development which incorporates transit-oriented development, in which land uses are situated near to each other and in close proximity to substantial alternative transportation resources. Transit-oriented development has been found to result in less energy usage overall, fewer vehicle trips, and other ancillary benefits which serve to lower the overall energy usage of a given project. See Section 4.13, Climate Change and Greenhouse Gasses, for more information.

Chapter 5 of the Master Plan includes provisions which would help to ensure efficient use of energy by the uses of the Master Plan, including:

- Use of recycled materials during construction;
- Use of locally produced materials during construction;
- Required use of green building practices;
- Encouraged incorporation of renewable energy sources; and
- Increased energy efficiency beyond that required by California Title 24.

Finally, as described in Section 4.4, Transportation and Traffic, the proposed Master Plan includes an integrated network of pedestrian/bicycle routes and paths designed to provide a working alternative for residents of both the Master Plan and surrounding properties to driving their vehicles to the BART station and the commercial uses of the Master Plan.

Considering the effects of mitigation in this DEIR and the design requirements of the Master Plan itself, the proposed Master Plan is not expected to use energy in an inefficient, wasteful, or unnecessary manner and the impact according to State CEQA Guidelines Appendix F would be **less than significant**.

Mitigation Measures

No additional measures required.

4.11.7.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The cumulative setting for electrical, natural gas, telephone, and cable services encompasses the service areas of the each particular service provider (e.g., PG&E, AT&T, and Comcast), under full development of the Master Plan area. The cumulative setting for electric service and natural gas also includes Northern California, which until recently was experiencing a great amount of growth and a subsequent cumulative demand for these services and related infrastructure.

The California electrical industry was deregulated in March 1998. Since the summer of 2000, the state has been experiencing a shortage of electrical generation. This shortage has been caused by several factors, including, but not limited to, substantial statewide population and industry growth, complications associated with deregulation, increases in power and natural gas costs, decreases in power generation capacity of the Pacific Northwest (Oregon and Washington), and inadequate power generation capacity within the state. However, the recent national economic situation and its ancillary effects have slowed growth in CA and the cumulative area. Based on the current situation with the California Energy Commission, it is anticipated that power supplies will be available to serve California in the short term.

CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Impacts to Electrical, Natural Gas, and Telecommunication Services

Impact 4.11.7.3 Implementation of the proposed Master Plan, as well as potential development in the surrounding areas, would result in an increase in cumulative utility service demands. The proposed Master Plan would have a **less than cumulatively considerable** impact on electrical, natural gas, telephone, and cable television services.

As growth in the vicinity of the City of Pittsburg and Contra Costa County occurs, it is anticipated that PG&E would need to construct new substations to provide adequate electrical service to the Master Plan area. Additional transmission lines would be necessary to deliver electrical and natural gas service. All distribution lines, substations, transmission, delivery facilities, and easements are subject to CEQA review. Potential environmental effects of obtaining more power through the development of power plants include, but are not limited to, air quality, biological resources, cultural resources, hazardous materials, land use, noise and vibration, traffic, visual resources, waste management, water and soil resources, and health hazards. Potential environmental effects for the construction of transmission lines include, but are not limited to, air quality (during construction), biological resources, cultural resources, hazardous materials, land use, noise and vibration (during construction), traffic, visual resources, and health hazards. However, it is not expected that the proposed project would trigger the need for these system-wide upgrades or modifications, and the project's contribution toward the demand for these upgrades is considered minimal.

Under cumulative conditions, individual development projects would continue to receive natural gas service from smaller gas lines that connect to the main transmission line. In order for future development areas to receive natural gas service, they would need to tap into the main transmission line and construct separate distribution gas lines that would extend into each development. Additional pressure reduction equipment and pressure regulators would also be required to provide adequate gas pressure to all future PG&E natural gas customers. The environmental effects of necessary improvements for natural gas infrastructure would be limited to temporary construction effects associated with air quality, noise, water quality, and temporary construction traffic control, as discussed in the representative sections of this DEIR. The provision of cable and cable services would not result in additional cumulative environmental impacts identified for electric or natural gas under Impact 4.11.7.1, as facilities are generally co-located and placed within public rights-of-way to reduce such impacts. The construction of new utility infrastructure is subject to CEQA review and compliance, and the physical effects of extending service and infrastructure will be analyzed on a project-by-project basis as new development proposals are received. Fee-based utilities and services, such as electric, natural gas, and cable/telephone, provide for additional development through capital improvements based on service fees and connection fees, which would ensure adequate funding mechanisms even for cumulative conditions.

Since future energy-related projects would be reviewed for project-level environmental impacts and the majority of this infrastructure would be collocated and constructed concurrently with other utilities within roadway rights-of-way to lessen or eliminate potential environmental effects, the proposed Master Plan's contributions to the continued provision of electrical, natural gas, and telecommunications services and infrastructure in the cumulative setting would be considered **less than cumulatively considerable**.

Mitigation Measures

None required.

REFERENCES

California Department of Education (CDE). 2008. School Facilities Planning Division. Guide to School Site Analysis and Development, 2000 Edition. Sacramento, CA.

——— (CDE). 2011. Mt. Diablo Unified School District Enrollment by Grade for 2009–10. Accessed February 16, 2011.

California Department of Public Health. 2009. Drinking Water Program. Retrieved online at http://www.cdph.ca.gov/programs/Pages/DWP.aspx. Accessed December 2009.

California Department of Resources Recycling and Recovery (CalRecycle). 2011a. Per Capita Disposal and Goal Measurement (Jurisdiction Diversion/Disposal Rate Summary). http://www.calrecycle.ca.gov/lgcentral/tools/mars/DrmcMain.asp?VW=In (accessed February 16, 2011).

———. 2011b. Solid Waste Characterization. http://www.calrecycle.ca.gov/wastechar (accessed February 22, 2011).

California Department of Water Resources (DWR). 2009. Groundwater. http://www.groundwater.water.ca.gov/ (accessed March 9, 2009).

California Energy Commission. 2008. http://www.energy.ca.gov/.

California Environmental Protection Agency, San Francisco Bay Regional Water Quality Control Board (RWQCB). 2011. http://www.swrcb.ca.gov/sanfranciscobay/index.shtml. (accessed February 16, 2011).

California's Water Recycling Task Force (CWRTF). 2003. Water Recycling 2030, Recommendations of California's Water Recycling Task Force.

Callahan, Officer Dan, Pittsburg Police Department. 2010. Personal communication with Leigha Schmidt, Planning Division, City of Pittsburg.

City of Pittsburg. 2001. Pittsburg 2020: A Vision for the 21st Century. City of Pittsburg General Plan. Includes Amendments through July 2010.

———. 2004. Environmental Impact Report for the Vista Del Mar Project. City of Pittsburg. SCH# 2004012097.

———. 2005. Pittsburg Urban Water Management Plan.

———. 2009a. Pittsburg Municipal Code. http://www.codepublishing.com/ ca/pittsburg/. (accessed January 2011)

———.2009b. Railroad Avenue Station Area Specific Plan Draft Environmental Impact Report.

———. 2010. Water System Master Plan: Final Draft. Prepared by Akel Engineering Group. Adopted by Resolution 01-11546.

Contra Costa County and City of Pittsburg. 2001. Pittsburg/Bay Point BART Station Area Specific Plan Environmental Impact Report (Recirculated). Prepared in conjunction with Bay Area Rapid Transit. SCH 98022071.

Contra Costa County. 2008. East Contra Costa BART Extension Draft EIR.

Contra Costa LAFCo. 2007. East Contra Costa County Water and Wastewater MSR. Adopted 12/19/2007. http://www.contracostalafco.org/municipal_service_reviews.htm (accessed February 16, 2011).

Contra Costa Water District (CCWD). 2002. Contra Costa Water District Future Water Supply Study 2002 Update: Final Report.

———. 2001. Future Water Supply Implementation Environmental Impact Report. SCH No. 97072064.

———. 2005. Urban Water Management Plan. Prepared by the Contra Costa Water District Planning Division.

Mt. Diablo Unified School District (MDUSD). 2009. 2008-2009 Enrollment.

———. 2010. About the District. Retrieved online: http://www.mdusd.k12.ca.us. Accessed December, 2010.

Pease, Walter, Director of Water Utilities, Pittsburg Public Works Department. 2010. Personal communication with Leigha Schmidt, Planning Division, City of Pittsburg.

Scorecard. 2009. Scorecard Pollution Information Site. Retrieved online: http://scorecard.goodguide.com/ranking/ Accessed December 2009.

South Bay Water Recycling. 2011. Regulation. http://www.sanjoseca.gov/sbwr/regulation.htm (accessed February 16, 2011).

State Water Resources Control Board (SWRCB). 2011. http://www.waterboards.ca.gov/ (accessed February 16, 2011).

United States Department of Energy (DOE). 2010. Porter-Cologne Water Quality Control Act.

United States Environmental Protection Agency (EPA). 2011. http://www.epa.gov/ (accessed February 16, 2011).

4.12 RECRECREATION

This section describes recreational resources in the City of Pittsburg and identifies the major park and recreation facilities that are operated and maintained by the City of Pittsburg Recreation Department.

4.12.1 EXISTING SETTING

COMMUNITY CENTERS

There are three community centers within the City of Pittsburg: the Pittsburg Community Center for Senior Services at 300 Presidio Lane, the Pittsburg Community Center Teen Services within City Park, and the Buchanan Park Community Center located at 4150 Harbor Street (City of Pittsburg 2009). At present, the teen and senior community centers are used to host a variety of community events and leisure time activities. Currently, the Buchanan Park Community Center and the Sullenberger Swim Center for aquatic activities is closed for upgrades that are identified on the City's adopted Capital Improvements Projects list.

PARKS AND OPEN SPACE

The City has approximately 400 acres of parks and recreational facilities, as well as public trails (City of Pittsburg 2009). The Pittsburg Public Works Department manages the maintenance of the City's park facilities, and the Recreation Department manages the operation of the parks. The Development Services Department is responsible for acquisition and development of park facilities. **Table 4.12-1** provides a summary of parkland and public open space in the city.

TABLE 4.12-1
PARKLAND AND OPEN SPACE

Name	Location	Acres
8th Street Greenbelt	8th Street	4.7
Americana Park	N. Parkside Drive	2.0
Ambrose Park	S. Broadway Avenue	12.3
Buchanan Park	4150 Harbor Street	16.0
California Seasons Park	Seasons Way	2.5
Central Park	Pittsburg/Antioch Highway	8.0
City Park	17th & Railroad	28.0
Columbia Linear Park	Columbia Avenue	4.4
De Anza Park	Trident Drive	3.5
Heritage Park Plaza	East 4th Street	0.1
Highland Ranch Park	Buchanan Road	10
Highland Park	Golden Hill Drive & St. Paul Circle	4.5
Hillsdale Park	Daffodil & Jacqueline Drive	3.5
John Henry Johnson Picnic Area	John Henry Johnson Parkway	N/A
Larry Lasater Park	San Marcos Boulevard	3.0
Marina Walk Park	W. 6th & Cutter	1.7

Name	Location	Acres
Mariner Park	8th Street & Herb White Way	3.6
Oak Hills Park	Southwood Drive	5.0
Riverview Park	Bayside Drive	4.0
Small World Park	2573 Harbor Street	8.0
Stoneman Park (North)	W. Leland & John Henry Johnson Parkway	8.0
Santa Fe Linear Park	Santa Fe Avenue	2.6
Woodland Hills Park	Crestview & Alta Vista Drive	2.4
Village Park at New York Landing	Cambria Drive	2.0
Stoneman Park (South)[1]	West Leland & John Henry Johnson Parkway	182.0
Delta de Anza Trail[1]	Along the Mokelumne Aqueduct	78.0
	Total	**399.8**

Source: City of Pittsburg 2010a; [1] City of Pittsburg 2009.

4.12.2 REGULATORY FRAMEWORK

STATE

Government Code and California Parklands Act of 1980

Although a recreation element is not mandated by law to be included in a general plan, recreation resources are to be considered in the open space element of a general plan (Government Code Section 65560). The California Parklands Act of 1980 (Public Resources Code Section 5096.141–5096.143) identifies "the public interest for the state to acquire, develop, and restore areas for recreation . . . and to aid local governments of the state in acquiring, developing and restoring such areas." The California Parklands Act also identifies the necessity of local agencies to exercise vigilance to see that the parks, recreation areas, and recreational facilities they now have are not lost to other uses.

California Recreational Trails Act of 1974

The California Recreational Trails Act includes two major components: the reauthorization of the California Recreational Trails Committee and the requirement to develop a California Recreational Trails System Plan.

The California Recreational Trails Act (Public Resources Code Section 5070.5) declares:

- Increase accessibility and enhance the use, enjoyment, and understanding of California's scenic, natural, historic, and cultural resources.
- Encourage hiking, horseback riding, and bicycling as important contributions to the health and welfare of the state's population.
- Provide for the use of recreational trails by physically disabled persons, the elderly, and others in need of graduated trails.
- Increase opportunities for recreational boating and use of recreational vehicles.

- Encourage the development by cities, counties, districts, and private groups of recreational and interpretive trails, including heritage corridors.

Quimby Act

Cities and counties have been authorized through the 1975 Quimby Act (California Government Code Section 66477) to pass ordinances requiring developers to set aside land, donate conservation easements, or pay fees for park improvements. Revenues generated through the Quimby Act are not to be used for the actual operation or maintenance of park facilities. A 1982 amendment (Assembly Bill 1600) requires agencies to clearly show a reasonable relationship between the public need for the recreation facility or parkland and the type of development project upon which the fee is imposed. Cities or counties with a high ratio of park space to inhabitants can set a standard of 5 acres per 1,000 residents for new development. Cities or counties with a lower current ratio can only require the provision of up to 3 acres of park space per 1,000 residents. The calculation of a city's or county's park space-to-population ratio is based on a comparison of the population count of the last federal census to the amount of city- or county-owned parkland.

City of Pittsburg General Plan

Relevant City of Pittsburg General Plan policies related to recreational resources are provided below. **Table 4.12-2** discusses the project's consistency with the City's General Plan policies. While this DEIR analyzes the project's consistency with the General Plan pursuant to California Environmental Quality Act (CEQA) Guidelines Section 15125(d), the Pittsburg City Council ultimately determines consistency with the General Plan.

TABLE 4.12-2
PROJECT CONSISTENCY WITH APPLICABLE GENERAL PLAN RECREATION POLICIES

General Plan Policies	Consistency with General Plan	Analysis
Policy 8-P-1 – Maintain a neighborhood and community park standard of 5 acres of public parkland per 1,000 residents.	Yes	The Master Plan is proposing 1.5 acres of park/public open space features, which would bring the new citywide total of parkland and open space acreage, including trails, to 401.3 acres. If the number of residents to be added by the Master Plan (3,738) is added to the 2010 population of the City (63,926), the total population of the City would be 67,664. At 5 acres of parks and open space per 1,000 residents that would point to a need for 338.3 acres of parks and open space, below what would exist in the City with implementation of the Master Plan.
Policy 8-P-2 – Pursue the development of park and recreation facilities within reasonable walking distance of all homes.	Yes	The Master Plan proposes a park feature located adjacent to a major intersection on the Master Plan area that would be substantially surrounded by high-density residential area. In addition, a public use open space area is proposed that would also be located within walking distance of both high- and medium-density residential areas.
Policy 8-P-3 – Develop public parks and recreational facilities that are equitably	Yes	See analysis of General Plan Policy 8-P-2 above.

General Plan Policies	Consistency with General Plan	Analysis
distributed throughout the urbanized area, and provide neighborhood recreation facilities in existing neighborhoods where such facilities are presently lacking.		
Policy 8-P-4 – Consider park accessibility, use and character as more valuable than size in the acquisition and development of new parks.	Yes	The Master Plan proposes a network of pedestrian/bicycle pathways throughout the project as well as connections both to West Leland Road to the south and to the Oak Hills Shopping Center via the bus approach ramp to the east. Also proposed is a pedestrian connection between the BART property and the medium-density residential uses located on the western half of the Master Plan site.
Policy 8-P-5 – Maintain park and recreation facility standards for new development to serve both residents and employees, attainable through dedication of parkland or payment of in-lieu fees.	Yes	See analysis of General Plan Policy 8-P-1 above.
Policy 8-P-7 – Encourage the development or provision of facilities that cater to diverse recreational interests.	Yes	See analysis of General Plan Policy 8-P-1 above

City of Pittsburg Municipal Code

Title 17 of the Pittsburg Municipal Code (PMC) includes Section 17.32.020 guiding parkland dedication for any tentative or parcel map approval in the city. According to Section 17.32.020, tentative or parcel maps may take one of two approaches or a combination therein.

Land Dedication

The amount of land required to be dedicated to parks or recreation under Section 17.32.020(D) is based on the number of units of either single-family or multi-family housing provided by a given project. Specifically, 1.73 acres of parks or recreation must be dedicated per 100 units of single-family housing and 1.325 acres per 100 units of multi-family housing.

In-Lieu Fees

In-lieu fees are calculated by the City by applying the acreage requirement for dedication and multiplying that by the "fair-value" price for similar land in the city, as determined by the City Engineer according to strict criteria.

4.12.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Based on California Environmental Quality Act (CEQA) Guidelines, Appendix G, the proposed Master Plan would be expected to result in significant recreation impacts if the project would:

1. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

2. Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

According to the Initial Study for the Master Plan, issued by the City concurrently with the Notice of Preparation on December 7, 2010, the proposed Master Plan was expected to result in less than significant recreation impacts. However, during the scoping meeting for the project, the Pittsburg Planning Commission requested that an analysis of recreational impacts be included. As a response to that request, the following analysis is presented.

METHODOLOGY

Evaluation of potential park and recreation service impacts was based on review of the most relevant literature. A list of reference material used can be found at this end of this section. This material was compared to the proposed Master Plan's specific park and recreation service-related impacts. The impact analysis below focuses on whether those impacts would have a significant effect on the physical environment, as required by the State CEQA Guidelines.

IMPACTS AND MITIGATION MEASURES

Increased Use of Existing Parks and Recreational Facilities

Impact 4.12.1 Implementation of the proposed Master Plan would result in population growth in the city over the next 20 years, which would not result in over-capacity issues at existing recreational facilities nor would it encourage the construction of additional recreational facilities outside the Master Plan Area. This impact is considered **less than significant**.

It is important to note that the land use designations of the Master Plan area include a variety of development types and densities, and those used for the purpose of this analysis are based on assumptions. For instance, the Flex land use designation allows for residential, retail, office/commercial, or quasi-public uses, or any combination thereof. In order to project reasonable estimates of resultant population for the purposes of this analysis, an estimated development buildout was determined in the form of expected dwelling units (see Section 4.0, Assumptions, of this DEIR).

The proposed Master Plan would allow for the development of up to 1,168 new residential units over the next 20 years (though it should be noted that the project does not require that this extent of development occur). Based on the city's average household size of 3.20 persons, the development and occupation of 1,168 new residential units in the city would result in a population increase of approximately 3,738 persons.[1] When this increase in residents is added to the 2010 population of the City (63,926) the project would be expected to increase the number of residents in the City to 67,664 (existing plus project).

[1] See Section 4.2, Population, Housing, and Employment, of this DEIR for a detailed discussion of growth anticipated to occur as a result of the proposed Master Plan.

Policy 8-P-1 of the City of Pittsburg General Plan sets a park standard of 5 acres of parkland per 1,000 residents. This policy reflects the Quimby Act's highest standard (see Regulatory Framework subsection above). The Master Plan is proposing 1.5 acres of park/public open space features[2], which would bring the new citywide total of parkland and open space acreage, including trails, to 401.3 acres (see **Table 4.12-1** for existing park acreages). The minimum citywide park/open space acreage needed to satisfy the requirements of Policy 8-P-1, according to the total current population of the city plus the residents generated by the proposed Master Plan, would be 338.2 acres (67,654/1000*5). Following development of the proposed project, there would be approximately 63 acres of parkland in the City in excess of those required by Policy 8-P-1, it can be ascertained that there exists enough parkland acreage within the city to accommodate project population increases from the Master Plan.

In addition, PMC Section 17.32.020 will require that the project proponents pay an in-lieu fee equal to the fair value of the amount of parkland required by that section of the Municipal Code. The proposed Master Plan is expected to result in development of 1,168 multi-family dwelling units (see Section 4.0, Assumptions). As such, the Master Plan would be required to dedicate or pay in-lieu fees for approximately 15.5 acres of parkland. As the proposed Master Plan would provide, at the least, 1.5 acres of park, an additional 14 acres of land must be accounted for. Additional credits may be granted to the project at time of tentative map approval due to greenways along major roadways or the public plaza, as well as a partial credit for private recreational uses expected to be constructed within the West Coast Home Builders (WCHB) property. As such, it is expected that the actual amount of required dedication or fee would be less than 14 acres. Regardless, the requirements of the Pittsburg Municipal Code would ensure that adequate parkland is dedicated and fees are collected to account for the recreational needs of the City and the Master Plan.

Any fees collected, according to the Pittsburg Municipal Code, would be spent on either acquiring or developing new parks or rehabilitating or enhancing old parks. As the current stock of parks and recreation land in the city exceeds the General Plan requirement stated in Policy 8-P-1, even when the additional population generated by the Master Plan is taken into account, it is reasonable to assume that fees collected from the Master Plan could be used by the City to go toward renovation and enhancement of current park/recreation resources. As such, the proposed Master Plan would not result in substantial physical deterioration of recreational facilities due to population growth-related capacity issues. The impacts of any improvements to current parks are expected to be less than significant due to the fact that repair and enhancement has much less environmental impact than dedication of new park facilities. As such, this impact is considered **less than significant**.

Mitigation Measures

None required.

4.12.4 CUMULATIVE SETTING, IMPACTS, AND MITIGATION MEASURES

CUMULATIVE SETTING

The cumulative setting for recreation consists of the City of Pittsburg Recreation Department services. Existing, planned, proposed, approved, and reasonably foreseeable development

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[2] Impacts associated with the construction of these proposed park/open space features, such as air quality and biological resources, are addressed in the technical sections of this Draft EIR.

within the city that currently places demand on the City's parks, public open space, and recreation facilities, or is expected to place demand on them in the future, could contribute to cumulative impacts.

Cumulative Recreation Demands

Impact 4.12.2 Implementation of the proposed Master Plan, in conjunction with other future development, would not require additional park and recreation facilities within the boundaries of the city. This impact would be **less than cumulatively considerable**.

Implementation of the proposed Master Plan would address future City needs for parks and recreational facilities through implementation of 1.5 acres of parkland and public open space features and payment of in-lieu fees (see Impact 4.12.1 above). In addition, there are currently a substantial number of park and recreational facilities throughout the city. The new citywide total of parkland and open space acreage, including trails, would be 401.3 acres with implementation of the proposed Master Plan. As described under Impact 4.12.1, the minimum citywide park/open space acreage needed to satisfy the requirements of General Plan Policy 8-P-1, with implementation of the proposed project, would be 343 acres. According to data presented in Section 4.2, Population and Housing, the City of Pittsburg is expected to have 66,216 residents by 2015. With the addition of project population (3,738 persons) the City is expected to contain 67,664 residents by 2015. According to the requirements of Policy 8-P-1, that population would require approximately 349.7 acres of parkland. As such, the city would contain enough park and recreation resources (401.3 acres) to accommodate growth anticipated in the future.

All future development projects in Pittsburg, including the proposed Master Plan, would be subject to dedication requirements and/or in-lieu fees required by the Pittsburg Municipal Code to fund the provision of physical recreational facilities. These fees and policy provisions ensure that the City will adequately provide for recreation needs for residents. Furthermore, it is anticipated that any new parkland dedicated by the City in the future would conform to parks and recreation uses described in the General Plan. As the General Plan was adopted along with an EIR, according to the requirements of CEQA, and as that EIR included discussion of the potential environmental impacts of such dedications, no further analysis is required at this time. As the proposed Master Plan conforms to the development requirements of the General Plan, and as parkland in the cumulative setting would be adequate to serve the projected population of the City, it is anticipated that the cumulative impact would be **less than cumulatively considerable.**

Mitigation Measures

None required.

REFERENCES

California Department of Finance (DOF). 2010. *City/County Population and Housing Estimates.* January 1, 2010.

City of Pittsburg. 2000. Environmental Impact Report for Pittsburg 2020: A Vision for the 21st Century. State Clearinghouse Number: 1999072109.

———. 2001. Pittsburg 2020: A Vision for the 21st Century. City of Pittsburg General Plan. Includes Amendments through July 2010.

———. 2009. *Railroad Avenue State Area Specific Plan Draft Environmental Impact Report*. February 25, 2009.

———. 2010a. Parks at a Glance. http://www.ci.pittsburg.ca.us/index.aspx?page=440.

———. 2010b. Pittsburg Municipal Code. http://www.codepublishing.com/ca/pittsburg/ (accessed January 2011).

4.13 CLIMATE CHANGE AND GREENHOUSE GASES

This section provides a discussion on the Master Plan's effect on greenhouse gas emissions and the associated effects of climate change. The California Environmental Quality Act (CEQA) requires that lead agencies consider the reasonably foreseeable adverse environmental effects of projects they are considering for approval. The reader is referred to Section 4.6, Air Quality, for a discussion of project impacts associated with air quality.

4.13.1 EXISTING SETTING

EXISTING CLIMATE SETTING

To fully understand global climate change, it is important to recognize the naturally occurring "greenhouse effect" and to define the greenhouse gases that contribute to this phenomenon. Various gases in the earth's atmosphere, classified as atmospheric greenhouse gases (GHGs), play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space and a portion of the radiation is absorbed by the earth's surface. The earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation. Greenhouse gases, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Motor vehicles make up the bulk of GHG emissions produced on an operational basis for most nonindustrial projects. The primary greenhouse gases emitted by motor vehicles include carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons (CARB 2004). Following are descriptions of the primary greenhouse gases attributed to global climate change, including a description of their physical properties, primary sources, and contribution to the greenhouse effect.

Carbon Dioxide

Carbon dioxide (CO2) is a colorless, odorless gas. CO2 is emitted in a number of ways, both naturally and through human activities. The largest source of CO2 emissions globally is the combustion of fossil fuels such as coal, oil, and gas in power plants, automobiles, industrial facilities, and other sources. A number of specialized industrial production processes and product uses such as mineral production, metal production, and the use of petroleum-based products can also lead to CO2 emissions. The atmospheric lifetime of CO2 is variable because it is so readily exchanged in the atmosphere (EPA 2008a).

Methane

Methane (CH4) is a colorless, odorless gas that is not flammable under most circumstances. CH4 is the major component of natural gas, about 87 percent by volume. It is also formed and released to the atmosphere by biological processes occurring in anaerobic environments. Methane is emitted from a variety of both human-related and natural sources. Human-related sources include fossil fuel production, animal husbandry (enteric fermentation in livestock and manure management), rice cultivation, biomass burning, and waste management. These activities release significant quantities of methane to the atmosphere. Natural sources of methane include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and other sources such as wildfires. Methane's atmospheric lifetime is about 12 years (EPA 2006a).

Nitrous Oxide

Nitrous oxide (N_2O) is a clear, colorless gas with a slightly sweet odor. N_2O is produced by both natural and human-related sources. Primary human-related sources of N_2O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, adipic acid production, and nitric acid production. N_2O is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests. The atmospheric lifetime of N_2O is approximately 120 years (EPA 2006b).

Hydrofluorocarbons

Hydrofluorocarbons (HFCs) are man-made chemicals, many of which have been developed as alternatives to ozone-depleting substances for industrial, commercial, and consumer products. The only significant emissions of HFCs before 1990 were of the chemical HFC-23, which is generated as a byproduct of the production of HCFC-22 (or Freon 22, used in air conditioning applications). The atmospheric lifetime for HFCs varies from just over a year for HFC-152a to 260 years for HFC-23. Most of the commercially used HFCs have atmospheric lifetimes less than 15 years (e.g., HFC-134a, which is used in automobile air conditioning and refrigeration, has an atmospheric life of 14 years) (EPA 2006c).

Perfluorocarbons

Perfluorocarbons (PFCs) are colorless, highly dense, chemically inert, and nontoxic. There are seven PFC gases: perfluoromethane (CF_4), perfluoroethane (C_2F_6), perfluoropropane (C_3F_8), perfluorobutane (C_4F_{10}), perfluorocyclobutane (C_4F_8), perfluoropentane (C_5F_{12}), and perfluorohexane (C_6F1_4). Natural geological emissions have been responsible for the PFCs that have accumulated in the atmosphere in the past; however, the largest current source is aluminum production, which releases CF_4 and C_2F_6 as by-products. The estimated atmospheric lifetimes for CF_4 and C_2F_6 are 50,000 and 10,000 years, respectively (EFCTC 2003; EPA 2006a).

Nitrogen Trifluoride

Nitrogen trifluoride (NF_3) is an inorganic, colorless, odorless, toxic, non-flammable gas used as an etchant in micro-electronics. Nitrogen trifluoride is predominantly employed in the cleaning of the plasma-enhanced chemical vapor deposition chambers in the production of liquid crystal displays and silicon-based thin film solar cells. It has a global warming potential of 17,200 CO_2e. While NF_3 may have a lower global warming potential than other chemical etchants, it is still a potent GHG. In 2009, NF_3 was listed by California as a high global warming potential GHG to be listed and regulated under Assembly Bill (AB) 32 (Section 38505 Health and Safety Code).

Sulfur Hexafluoride

Sulfur hexafluoride (SF_6) is an inorganic compound that is colorless, odorless, nontoxic, and generally nonflammable. SF_6 is primarily used as an electrical insulator in high voltage equipment. The electric power industry uses roughly 80 percent of all SF_6 produced worldwide. Significant leaks occur from aging equipment and during equipment maintenance and servicing. SF_6 has an atmospheric life of 3,200 years (EPA 2008b).

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. Gases with high global warming potential, such as HFCs, PFCs, and SF_6, are the most heat-absorbent. Methane traps over 21 times more heat per molecule than CO_2, and N_2O absorbs 310 times more heat per molecule than CO_2. Often, estimates of GHG emissions are presented in carbon dioxide equivalents (CO_2e), which weight each gas by its global warming potential (GWP). Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted. **Table 4.13-1** shows the GWPs for different GHGs for a 100-year time horizon.

TABLE 4.13-1
GLOBAL WARMING POTENTIAL FOR GREENHOUSE GASES

Greenhouse Gas	Global Warming Potential
Carbon Dioxide (CO_2)	1
Methane (CH_4)	21
Nitrous Dioxide (N_2O)	310
Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs)	6,500
Sulfur Hexafluoride (SF_6)	23,900

Source: BAAQMD 2006

As the name implies, global climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern, respectively. California is significant emitter of CO_2 in the world and produced 477 million gross metric tons of carbon dioxide equivalents in 2008 (CARB 2010). Consumption of fossil fuels in the transportation sector was the single largest source of California's GHG emissions in 2008, accounting for 36.4 percent of total GHG emissions in the state (CARB 2010). This category was followed by the electric power sector (including both in-state and out-of-state sources) (24.3 percent) and the industrial sector (19.3 percent) (CARB 2010).

EFFECTS OF GLOBAL CLIMATE CHANGE

The effects of climate change in California are the subject of substantial scientific research conducted by experts at various state universities and research institutions. With more than a decade of concerted research, scientists have established that the early signs of climate change are already evident in the state—as shown, for example, in increased average temperatures, changes in temperature extremes, reduced snowpack in the Sierra Nevada, sea level rise, and ecological shifts.

Many of these changes are accelerating—locally, across the country, and around the globe. As a result of emissions already released into the atmosphere, California will face intensifying climate changes in coming decades (CNRA 2009). Generally, research indicates that California should expect overall hotter and drier conditions with a continued reduction in winter snow (with concurrent increases in winter rains), as well as increased average temperatures, and accelerating sea-level rise. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing (CNRA 2009).

Climate change temperature projections identified in the 2009 California Climate Adaptation Strategy suggest the following (CNRA 2009):

- Average temperature increase is expected to be more pronounced in the summer than in the winter season.

- Inland areas are likely to experience more pronounced warming than coastal regions.
- Heat waves are expected to increase in frequency, with individual heat waves also showing a tendency toward becoming longer, and extending over a larger area, thus more likely to encompass multiple population centers in California at the same time.
- As GHGs remain in the atmosphere for decades, temperature changes over the next 30 to 40 years are already largely determined by past emissions. By 2050, temperatures are projected to increase by an additional 1.8 to 5.4 °F (an increase one to three times as large as that which occurred over the entire 20th century).
- By 2100, the models project temperature increases between 3.6 to 9 °F.

Precipitation levels are expected to change over the 21st century, though models differ in determining where and how much rain and snowfall patterns will change (CNRA 2009). Eleven out of 12 precipitation models run by the Scripps Institution of Oceanography suggest a small to significant (12–35 percent) overall decrease in precipitation levels by mid-century (CNRA 2009). In addition, higher temperatures increase evaporation and make for a generally drier climate, as higher temperatures hasten snowmelt. Moreover, the 2009 California Climate Adaptation Strategy concludes that more precipitation will fall as rain rather than as snow, with important implications for water management in the state. California communities have largely depended on runoff from yearly established snowpack to provide the water supplies during the warmer, drier months of late spring, summer, and early autumn. With rainfall and meltwater running off earlier in the year, the state will face increasing challenges of storing the water for the dry season while protecting Californians downstream from floodwaters during the wet season.

Changes in average temperature and precipitation are significant. Yet gradual changes in average conditions are not all for which California must prepare. In the next few decades, it is likely that the state will face a growing number of climate change-related extreme events such as heat waves, wildfires, droughts, and floods. Because communities, infrastructure, and other assets are at risk, such events can cause significant damages and are already responsible for a large fraction of near-term climate-related impacts every year (CNRA 2009).

Most climate projections developed to date, including those used in this section of the DEIR, produce gradual if sometimes substantial changes for a given climate variable. In the past, rapid climate changes have been observed and scientists are increasingly concerned about additional abrupt changes that could push natural systems past thresholds beyond which they could not recover. Such events have been recorded in paleoclimatological records but current global climate models cannot predict when they may occur again (CNRA 2009). Such abrupt changes have been shown to occur over very short periods of time (a few years to decades) and thus represent the most challenging situations to which society and ecosystems would need to adapt (CNRA 2009). Short of being able to predict such abrupt changes, scientists are focusing their attention on aspects of the climate and earth system called "tipping elements" that can rapidly bring about abrupt changes.

Tipping elements refer to thresholds where increases in temperature cause a chain reaction of mutually reinforcing physical processes in the earth's dynamic cycles. The most dangerous of these include the following (CNRA 2009):

- A reduction in Arctic sea ice, which allows the (darker) polar oceans to absorb more sunlight, thereby increasing regional warming, accelerating sea ice melting even further, and enhancing Arctic warming over neighboring (currently frozen) land areas.

- The release of methane (a potent GHG), which is currently trapped in frozen ground (permafrost) in the Arctic tundra, will increase with regional warming and melting of the ground, leading to further and more rapid warming and resulting in increased permafrost melting.

- Continued warming in the Amazon could cause significant rainfall loss and large scale dying of forest vegetation, which will further release CO2.

- The accelerated melting of Greenland and West Antarctic Ice Sheets observed in recent times, together with regional warming over land and in the oceans, involves mechanisms that can reinforce the loss of ice and increase the rate of global sea-level rise.

According to the 2009 California Climate Adaptation Strategy, the impacts of global warming in California have the potential to include, but are not limited to, the areas discussed below.

Public Health

Climate change is expected to lead to an increase in ambient (i.e., outdoor) average air temperature, with greater increases expected in summer than in winter months. Larger temperature increases are anticipated in inland communities as compared to the California coast. The potential health impacts from sustained and significantly higher than average temperatures include heat stroke, heat exhaustion, and the exacerbation of existing medical conditions such as cardiovascular and respiratory diseases, diabetes, nervous system disorders, emphysema, and epilepsy. Numerous studies have indicated that there are generally more deaths during periods of sustained higher temperatures, and these are due to cardiovascular causes and other chronic diseases. The elderly, infants, and socially isolated people with pre-existing illnesses who lack access to air conditioning or cooling spaces are among the most at risk during heat waves (CNRA 2009).

Floods and Droughts

The impacts of flooding can be significant. Results may include population displacement, severe psychosocial stress with resulting mental health impacts, exacerbation of pre-existing chronic conditions, and infectious disease (CNRA 2009). Additionally, impacts can range from a loss of personal belongings, and the emotional ramifications from such loss, to direct injury and/or mortality.

Drinking water contamination outbreaks in the U.S. are associated with extreme precipitation events (CNRA 2009). Floodwaters may contain household, industrial, and agricultural chemicals as well as sewage and animal waste. Flooding and heavy rainfall events can wash pathogens and chemicals from contaminated soils, farms, and streets into drinking water supplies (CNRA 2009). Flooding may also overload storm and wastewater systems, or flood septic systems, also leading to possible contamination of drinking water systems (CNRA 2009). Runoff from rainfall is also associated with coastal contamination that can lead to contamination of shellfish and contribute to food-borne illness.

Drought impacts develop more slowly over time. Risks to public health that Californians may face from drought include impacts on water supply and quality, food production (both agricultural and commercial fisheries), and risks of waterborne illness. As surface water supplies are reduced as a result of drought conditions, the amount of groundwater pumping is expected to increase to make up for the water shortfall. The increase in groundwater pumping has the potential to lower the water tables and cause land subsidence (CNRA 2009). Communities that utilize well water will be adversely affected by drops in water tables or through changes in water quality. Groundwater supplies have higher levels of total dissolved solids compared to surface waters. This introduces a set of effects for consumers, such as repair and maintenance costs associated with mineral deposits in water heaters and other plumbing fixtures, and on public water system infrastructure designed for lower salinity surface water supplies. Drought may also lead to increased concentration of contaminants in drinking water supplies (CNRA 2009).

Water Resources

The state's water supply system already faces challenges to provide water for California's growing population. Climate change is expected to exacerbate these challenges through increased temperatures and possible changes in precipitation patterns. The trends of the last century—especially increases in hydrologic variability—will likely intensify in this century. We can expect to experience more frequent and larger floods and deeper droughts (CNRA 2009). Rising sea level will threaten the Delta water conveyance system and increase salinity in near-coastal groundwater supplies (CNRA 2009). Planning for and adapting to these simultaneous changes, particularly their impacts on public safety and long-term water supply reliability, will be among the most significant challenges facing water and flood managers this century.

Agriculture

Increased GHG emissions could cause widespread changes to the agriculture industry, reducing the quantity and quality of agricultural products statewide. First, California farmers could possibly lose as much as 25 percent of the water supply they need. California's farmers could face greater water demand for crops and a less reliable water supply as temperatures rise. Crop growth and development could change, as could the intensity and frequency of pest and disease outbreaks. Rising temperatures could aggravate ozone pollution, which makes plants more susceptible to disease and pests and interferes with plant growth.

Plant growth tends to be slow at low temperatures, increasing with rising temperatures up to a threshold. However, faster growth can result in less than optimal development for many crops, so rising temperatures could worsen the quantity and quality of yield for a number of California's agricultural products. Products likely to be most affected include wine grapes, fruits, and nuts. In addition, continued global climate change could shift the ranges of existing invasive plants and weeds and alter competition patterns with native plants. Range expansion could occur in many species while range contractions may be less likely in rapidly evolving species with significant populations already established. Should range contractions occur, new or different weed species could fill the emerging gaps. Continued global climate change could alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates.

Forests and Landscapes

Global climate change has the potential to intensify the current threat to forests and landscapes by increasing the risk of wildfire and altering the distribution and character of natural vegetation. If temperatures rise into the medium warming range, wildfire occurrence statewide could increase from 57 percent to 169 percent by 2085 (CNRA 2009). However, since wildfire risk is determined by a combination of factors, including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the state.

Fishing

Studies found that as a result of changes in ocean conditions, the distribution and abundance of major fish stocks will change substantially. Impacts to fisheries related to El Niño/Southern Oscillation illustrate how climate directly impacts marine fisheries on short-term scales. Higher sea surface temperatures in 1997–1998 during the El Niño had a great impact on market squid, California's largest fishery by volume. The California Regional Assessment reports that landings fell to less than 1,000 metric tons in that season, down from 110,000 tons in the 1996–1997 season. Other unusual events also occurred such as poor salmon returns, a series of plankton blooms, and seabird die-offs.

Coastline

With climate changes, recreational facilities and developed coastlines will also be more vulnerable to hurricanes, storm surges, and flooding. Increasing population growth in coastal areas is a reason for further concern, since these areas could be more vulnerable to climate change impacts. Impacts of expected sea level rise and increased storm surges are numerous. Beachfront homes and harbors as well as wetlands may flood. Sewage systems may be overwhelmed by storm runoff and high tides.

Sea Level Rise

The San Francisco Bay Conservation and Development Commission (BCDC) issued a report on sea level rise in April 2009, which states that sea level along the west coast rises approximately 7.9 inches per century, or approximately 0.08 inches per year (BCDC 2009). However, the rate of sea level rise is increasing. During the period of 1993–2003, the rate was approximately 0.12 inches per year, which could demonstrate the result of human-induced warming on sea level. The BCDC uses the same sea level rise estimates that are used by California Climate Action Team-funded assessments. These estimates anticipate the sea level in the Bay Area will rise 16 inches by mid-century and 55 inches by the end of the century. This data was used to make maps of projected flood areas but does not take into consideration existing shoreline protections; if an area is below sea level, it is shown as vulnerable on their maps despite any existing projections. By mid-century, approximately 180,000 acres of the Bay Area could be flooded, and 213,000 acres could be flooded by the end of the century. A large amount of development along the shoreline is vulnerable to flooding and erosion. Due to Bay Area topography, 100 percent of the development located in 100-year floodplain areas will likely flood by the year 2050. Also, different parts of the Bay Area are more vulnerable to flooding and erosion than others. In the vulnerable areas are several large commercial and industrial developments, including 93 percent of both the Oakland and the San Francisco airports, that may be inundated by 2100. Half of the vulnerable development is residential, and approximately 270,000 people would be at risk of flooding and problems with erosion. Approximately 4,300 acres of waterfront parks are expected to flood by 2100 (BCDC 2009).

The Bay Area currently has approximately 300 miles of public access to and along the San Francisco Bay shoreline. Eighty-seven (87) percent of that access is located in areas vulnerable to flooding and erosion by 2100. It may be very hard to relocate or re-create access opportunities in areas further inland. Jetties and seawalls may have to be raised and strengthened to protect harbors that are used for shipping, recreation, and tourism. As discussed above, by the year 2050, 100 percent of 100-year floodplain areas are expected to be flooded, and by the year 2100 an estimated 213,000 acres of Bay Area land, much of which is in the central Bay Area, could be impacted.

The City of Pittsburg, which encompasses the proposed Master Plan, is located in the eastern Bay Area. BCDC has produced a map showing the expected flooding that may occur in this area by the end of the century (see **Figure 4.13-1** for projected future sea level rise). Much of the developed Bay Area shoreline will require enhanced shoreline protection, which will be developed regionally to maximize safety and minimize impacts on sensitive Bay resources including public access, visual resources, and soil stability. Structural shoreline protections common to the Bay Area include seawalls, riprap revetments, and levees. These protections are reliable but expensive to build and maintain and often cause significant impacts to resources. Incorporating ecosystem elements with engineering elements would provide balanced and long-term shoreline protection.

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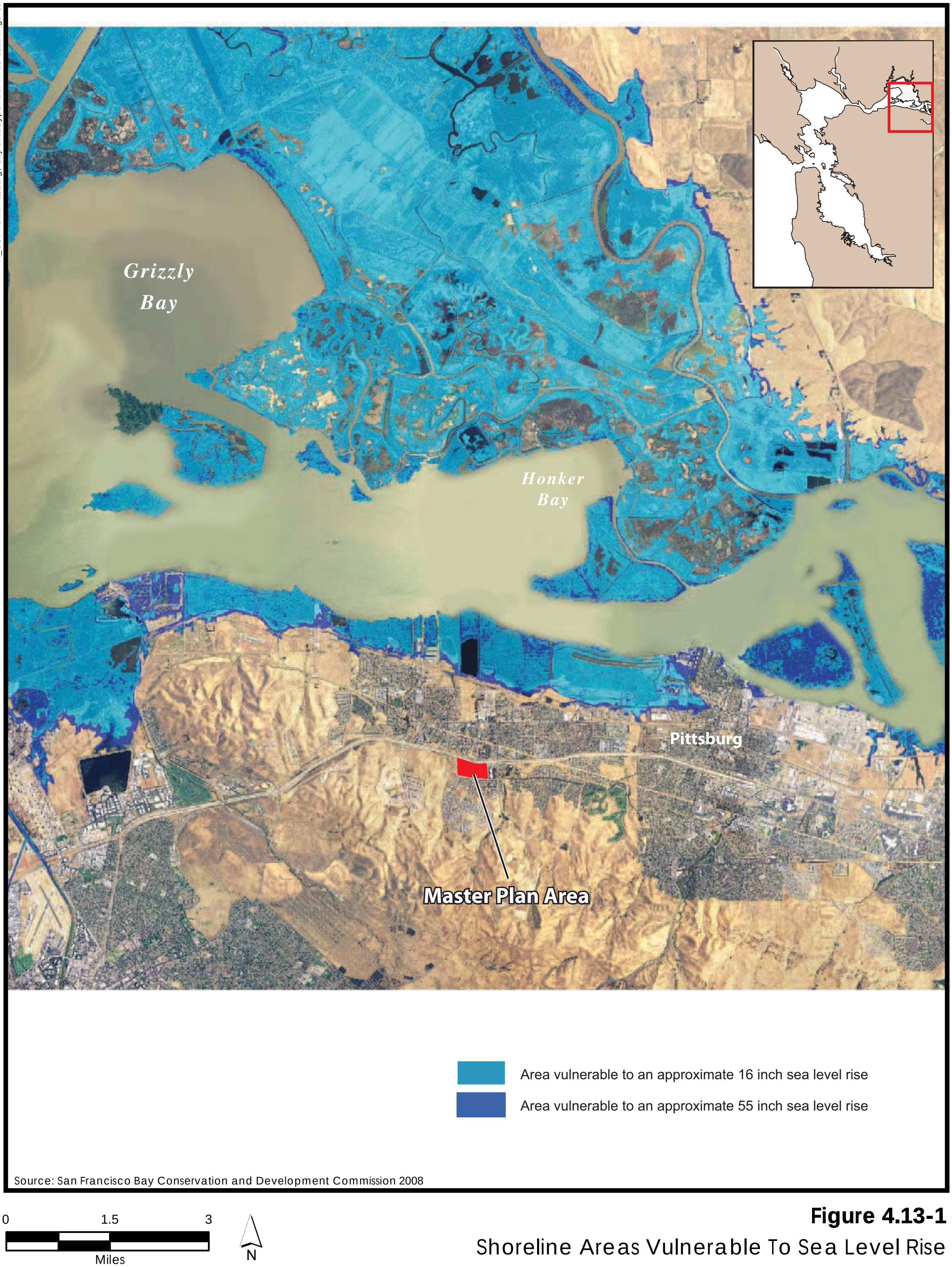

Source: San Francisco Bay Conservation and Development Commission 2008

Figure 4.13-1

Shoreline Areas Vulnerable To Sea Level Rise

PMC®

4.13.2 REGULATORY FRAMEWORK

FEDERAL

International Regulation and the Kyoto Protocol

The United States participates in the United Nations Framework Convention on Climate Change (UNFCCC). While the United States signed the Kyoto Protocol, which would have required reductions in GHGs, Congress never ratified the protocol. The federal government chose voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science. In 2002, the United States announced a strategy to reduce the greenhouse gas intensity of the American economy by 18 percent over a 10-year period from 2002 to 2012.

As part of the commitments to UNFCCC, the U.S. Environmental Protection Agency (EPA) has developed an inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases. This inventory is periodically updated, with the latest update in 2010 (EPA 2010a). The EPA reports that total U.S. emissions rose by 14 percent from 1990 to 2007, while the U.S. gross domestic product increased by 59 percent over the same period (EPA 2010a). A 2.9 percent decrease in emissions was noted from 2007 to 2008, which is reported to be attributable to climate conditions, reduced use of petroleum products for transportation, and increased use of natural gas over other fuel sources (EPA 2010a). The inventory notes that the transportation sector emits about 32 percent of CO_2 emissions, with 53 percent of those emissions coming from personal automobile use. Residential uses, primarily from energy use, accounted for 21 percent of CO_2 emissions (EPA 2010a).

As a part of the EPA's responsibility to develop and update an inventory of U.S. GHG emissions and sinks, the EPA compared trends of other various U.S. data. Over the period between 1990 and 2008, GHG emissions grew at an average rate of about 0.7 percent per year. Population growth was slightly higher at 1.1 percent, while energy and fossil fuel consumption grew at 0.9 and 0.8 percent, respectively. Gross domestic product and energy generation grew at much higher rates.

Federal Regulation and the Clean Air Act

In the past, the EPA has not regulated GHGs under the Clean Air Act (CAA) because it asserted that the act did not authorize the EPA to issue mandatory regulations to address global climate change and that such regulation would be unwise without an unequivocally established causal link between GHGs and the increase in global surface air temperatures. However, the U.S. Supreme Court held that the EPA must consider regulation of motor vehicle GHG emissions. In *Massachusetts v. Environmental Protection Agency et al.*, twelve states and cities, including California, together with several environmental organizations, sued to require the EPA to regulate GHGs as pollutants under the Clean Air Act (127 S. Ct. 1438 [2007]). The Court ruled that GHGs fit within the Clean Air Act's definition of a pollutant and that the EPA did not have a valid rationale for not regulating GHGs. In response to this ruling, the EPA has recently made an endangerment finding that GHGs pose a threat to the public health and welfare. This is the first step necessary for the establishment of federal GHG regulations under the Clean Air Act.

In April 2010, the EPA issued the final rule on new standards for GHG emissions and fuel economy for light-duty vehicles in model years 2017–2025. In November 2010, the EPA published the "Prevention of Significant Deterioration (PSD) and Title V Permitting Guidance for Greenhouse Gases," which provides the basic information that permit writers and applicants need to address

GHG emissions regulated under the Clean Air Act. In that document, the EPA described the "Tailoring Rule" in the regulation of GHG emissions. With the Tailoring Rule, the EPA established a phased schedule in the regulation of stationary sources. The first phase of the Tailoring Rule began January 2, 2011, and focuses the GHG permitting programs on the largest sources with the most Clean Air Act permitting experience. Then, in step two beginning June 1, 2011, the rule expands to cover large sources of GHGs that may not have been previously covered by the Clean Air Act for other pollutants. The rule also describes the EPA's commitment to future rulemaking that will describe subsequent steps of the Tailoring Rule for GHG permitting (EPA 2010b).

STATE

Assembly Bill 1493

Assembly Bill (AB) 1493 (Pavley) of 2002 (Health and Safety Code Sections 42823 and 43018.5) requires the California Air Resources Board (CARB) to develop and adopt the nation's first GHG emission standards for automobiles. These standards are also known as Pavley I. The California Legislature declared in AB 1493 that global warming is a matter of increasing concern for public health and the environment. It cites several risks that California faces from climate change, including a reduction in the state's water supply, an increase in air pollution caused by higher temperatures, harm to agriculture, an increase in wildfires, damage to the coastline, and economic losses caused by higher food, water, energy, and insurance prices. The bill also states that technological solutions to reduce GHG emissions would stimulate California's economy and provide jobs. In 2004, the State of California submitted a request for a waiver from federal clean air regulations, as the State is authorized to do under the CAA, to allow the State to require reduced tailpipe emissions of CO_2. In late 2007, the EPA denied California's waiver request and declined to promulgate adequate federal regulations limiting GHG emissions. In early 2008, the State brought suit against the EPA related to this denial.

In January 2009, President Obama instructed the EPA to reconsider the Bush Administration's denial of California's and 13 other states' requests to implement global warming pollution standards for cars and trucks. In June 2009, the EPA granted California's waiver request, enabling the State to enforce its GHG emissions standards for new motor vehicles beginning with the current model year.

Also in 2009, President Obama announced a national policy aimed at both increasing fuel economy and reducing GHG pollution for all new cars and trucks sold in the United States. The new standards would cover model years 2012 to 2016 and would raise passenger vehicle fuel economy to a fleet average of 35.5 miles per gallon (mpg) by 2016. When the national program takes effect, California has committed to allowing automakers who show compliance with the national program to also be deemed in compliance with state requirements. California is committed to further strengthening these standards beginning in 2017 to obtain a 45 percent GHG reduction from the 2020 model year vehicles.

Executive Order S-3-05

Executive Order S-3-05 (State of California) proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total greenhouse gas emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, to the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

The Executive Order directed the Secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce greenhouse gas emissions to the target levels. The Secretary will also submit biannual reports to the governor and state legislature describing (1) progress made toward reaching the emission targets, (2) impacts of global warming on California's resources, and (3) mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the Secretary of CalEPA created a Climate Action Team made up of members from various state agencies and commissions. The Climate Action Team released its first report in March 2006 and continues to release periodic reports on progress. The report proposed to achieve the targets by building on voluntary actions of California businesses, local government and community actions, as well as through state incentive and regulatory programs.

Assembly Bill 32, the California Global Warming Solutions Act of 2006

Assembly Bill 32 (Health and Safety Code Sections 38500, 38501, 28510, 38530, 38550, 38560, 38561–38565, 38570, 38571, 38574, 38580, 38590, 38592–38599) requires that statewide GHG emissions be reduced to 1990 levels by the year 2020. The gases that are regulated by AB 32 include carbon dioxide (CO_2), methane (CH_4), nitrogen dioxide (N_2O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. The reduction to 1990 levels will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires that CARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap, institute a schedule to meet the emissions cap, and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves reductions in GHG emissions necessary to meet the cap. CARB is implementing this program. The CARB Board adopted a draft resolution for formal cap-and-trade rulemaking on December 16, 2010, and is developing offset protocols and compliance requirements. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.

Climate Change Scoping Plan

In October of 2008, CARB published its Climate Change Proposed Scoping Plan, which is the State's plan to achieve GHG reductions in California required by AB 32. The scoping plan contains the main strategies California will implement to achieve reduction of 169 million metric tons (MMT) of CO_2e, or approximately 30 percent from the state's projected 2020 emission level of 596 MMT of CO_2e under a business-as-usual scenario (this is a reduction of 42 MMT CO_2e, or almost 10 percent, from 2002–2004 average emissions). The scoping plan also includes CARB-recommended GHG reductions for each emissions sector of the state's GHG inventory. The largest proposed GHG reduction recommendations are from improving emission standards for light-duty vehicles (estimated reductions of 31.7 MMT CO_2e), implementation of the Low-Carbon Fuel Standard (15.0 MMT CO_2e), energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO_2e), and a renewable portfolio standard for electricity production (21.3 MMT CO_2e). The scoping plan identifies the local equivalent of AB 32 targets as a 15 percent reduction below baseline greenhouse gas emissions level, with baseline interpreted as greenhouse gas emissions levels between 2003 and 2008. The scoping plan states that land use planning and urban growth decisions will play an important role in the state's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions. (Meanwhile, CARB is also developing an additional protocol for community emissions.) CARB further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. The proposed scoping plan states that the ultimate GHG reduction assignment to local government operations is to be determined. With regard to land use planning, the scoping plan expects approximately 5.0 MMT CO_2e will be achieved associated with implementation of SB 375, which is discussed further below. The Climate Change Proposed Scoping Plan was approved by CARB on December 11, 2008.

The status of the Climate Change Scoping Plan is currently uncertain as a result of a tentative court decision in the case of *Association of Irritated Residents v California Air Resources Board (*San Francisco Superior Court Case No. CPF-09-509562). In a January 24 tentative statement of decision, the court found that CARB, in its CEQA review, had not adequately explained why it selected a scoping plan that included a cap-and-trade program rather than an alternative plan. This decision has not been finalized, but CARB may be required to revise the CEQA review (a functional equivalent document) before proceeding further with the AB 32 scoping plan. The decision did not reject any of the substantive aspects of the scoping plan, and based on that, the court decision when finalized, and possible CARB action in response to the decision, is not expected to affect the substantive content of the scoping plan measures.

Senate Bill 1368

Senate Bill (SB) 1368 (codified at Public Utilities Code Chapter 3), is the companion bill of AB 32. SB 1368 required the California Public Utilities Commission (CPUC) to establish a greenhouse gas emission performance standard for baseload generation from investor-owned utilities by February 1, 2007. The bill also required the California Energy Commission (CEC) to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the greenhouse gas emission rate from a baseload combined-cycle natural-gas-fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the CPUC and CEC.

Senate Bill 1078 and Governor's Order S-14-08 (California Renewables Portfolio Standards)

Senate Bill 1078 (Public Utilities Code Sections 387, 390.1, 399.25 and Article 16) addresses electricity supply and requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide a minimum 20 percent of their supply from renewable sources by 2017. The Master Plan area would receive energy service from the investor-owned Pacific Gas and Electric Company. This Senate Bill will affect statewide GHG emissions associated with electricity generation. In 2008, Governor Schwarzenegger signed Executive Order S-14-08, which set the Renewable Portfolio Standard target to 33 percent by 2020. It directed state government agencies and retail sellers of electricity to take all appropriate actions to implement this target.

Prior to the Executive Order the California Public Utilities Commission and the California Energy Commission were responsible for implementing and overseeing the Renewables Portfolio Standards. The Executive Order shifted that responsibility to the California Air Resources Board (CARB), requiring them to adopt regulations by July 31, 2010. CARB is required by current law, AB 32 of 2006, to regulate sources of greenhouse gases to meet a state goal of reducing greenhouse gas emissions to 1990 levels by 2020 and an 80 percent reduction of 1990 levels by 2050.

CEC and CPUC are expected to serve in advisory roles to help CARB develop the regulations to administer the 33 percent by 2020 requirement. Additionally, CEC and CPUC will continue their implementation and administration of the 20 percent requirement. The Executive Order also stipulates that CARB may delegate to CPUC and CEC any policy development or program implementation responsibilities that would reduce duplication and improve consistency with other energy programs. CARB is also authorized to increase the target and accelerate and expand the time frame.

Senate Bill 375

Senate Bill 375 (codified at Government Code and Public Resources Code[1]), signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS), which will prescribe land use allocation in that MPO's Regional Transportation Plan. CARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years, but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects would not be eligible for funding programmed after January 1, 2012.

Executive Order S-13-08: The Climate Adaptation and Sea Level Rise Planning Directive

On November 14, 2008, Governor Schwarzenegger issued Executive Order S-13-08 in order to reduce and assess California's vulnerability to climate change and sea level rise. The Executive Order initiated four major actions:

- Initiate California's first statewide climate change adaptation strategy that will assess the state's expected climate change impacts, identify where California is most vulnerable and recommend climate adaptation policies by early 2009.
- Request the National Academy of Science establish an expert panel to report on sea level rise impacts in California to inform state planning and development efforts.
- Issue interim guidance to state agencies for how to plan for sea level rise in designated coastal and floodplain areas for new projects.
- Initiate a report on critical existing and planned infrastructure projects vulnerable to sea level rise. This report was released in 2009 as the California Adaptation Strategy (CNRA 2009).

[1] Senate Bill 375 is codified at Government Code Sections 65080, 65400, 65583, 65584.01, 65584.02, 65584.04, 65587, 65588, 14522.1, 14522.2, and 65080.01 as well as Public Resources Code Sections 21061.3, 21159.28, and Chapter 4.2.

California Building Energy Efficiency Standards

Title 24, Part 6 of the California Code of Regulations, known as the Building Energy Efficiency Standards, was established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. On January 1, 2011, the California Building Standards Commission adopted CALGreen and became the first state in the United States to adopt a statewide green building standards code. CALGreen will require new buildings to reduce water consumption by 20 percent, divert 50 percent of construction waste from landfills, and install low pollutant-emitting materials.

LOCAL

Bay Area Air Quality Management District

The Bay Area Air Quality Management District (BAAQMD) has developed new CEQA guidelines which provide strong guidance on regulating GHG emissions. These guidelines received final approval by the BAAQMD Board on June 2, 2010. BAAQMD's approach to developing a threshold of significance for GHG emissions is to identify the emissions level for which a project would not be expected to substantially conflict with existing California legislation adopted to reduce statewide GHG emissions. If a project would generate GHG emissions above the threshold level, it would be considered to contribute substantially to a cumulative impact.

City of Pittsburg 2005 Greenhouse Gas Emissions Inventory

In 2007, the Contra Costa County Climate Leaders (4CL) program was formed as a network for the County and its 19 cities to provide support for measuring and reducing greenhouse gas emissions. As part of the 4CL program, Pittsburg and fifteen other local governments in Contra Costa County joined the Cities for Climate Protection program offered by ICLEI – Local Governments for Sustainability.

Two separate emission inventories were prepared for the Greenhouse Gas Emissions Inventory: a community inventory and a municipal operations inventory. The community inventory includes GHG emissions resulting from activities that occur within the Pittsburg city limits such as industrial, transportation, commercial, residential, and waste disposal, in the year 2005 as well as that projected for 2020. The municipal operations inventory includes GHG emissions from activities that are recorded for City accounts such as energy use from water treatment and pumping, facility energy use, vehicle fleet gasoline and diesel consumption, employee commute trips, the electrical use of streetlights, and waste disposed, also in the year 2005 and as projected for 2020.

With a quantified GHG emissions inventory, the City of Pittsburg next plans to establish a reduction target and develop a Climate Action Plan, which is under development at the time of this writing. Key climate action strategies will be assessed during the development of the Climate Action Plan, which will suggest what degree of reduction is an appropriate target.

City of Pittsburg General Plan

Relevant City of Pittsburg General Plan policies related to air quality and greenhouse gases are provided below. **Table 4.13-2** discusses the project's consistency with the City's General Plan policies. While this Draft Environmental Impact Report (DEIR) analyzes the proposed project's consistency with the General Plan pursuant to California Environmental Quality Act (CEQA)

Guidelines Section 15125(d), the City of Pittsburg City Council ultimately determines consistency with the General Plan.

TABLE 4.13-2
PROJECT CONSISTENCY WITH GENERAL PLAN POLICIES

General Plan Policies	Consistency with General Plan	Analysis
Goal 9-G-9 – Work toward improving air quality and meeting all Federal and State ambient air quality standards by reducing the generation of air pollutants from stationary and mobile sources.	Yes	The proposed Master Plan includes dedicated pedestrian/bicycle pathways along the north side of West Leland Road, is located immediately adjacent to the Pittsburg/Bay Point BART station, and will include a large number of transit facilities (bus shelters, bus-only lanes, etc.). The internal circulation for both vehicles and pedestrians/bicyclists was designed in order to provide connectivity through the Master Plan area to the Pittsburg/Bay Point BART Station. As the proposed project constitutes transit-oriented development, and as such development has been found to reduce the overall number of vehicle trips, it is expected that the proposed project will have less air quality impacts than a comparable project without those features.
Goal 9-G-11 – Reduce the number of motor vehicle trips and emissions accounted to Pittsburg residents and encourage land use and transportation strategies that promote use of alternatives to the automobile for transportation, including bicycling, bus transit, and carpooling.	Yes	The land use designations of the Master Plan call for both street-level retail and flex uses, which will contain a mix of business commercial uses in conjunction with residential and quasi-business uses conducive to alternative modes of transportation. The Master Plan includes dedicated pedestrian/bicycle pathways along the north side of West Leland Road and is located immediately adjacent to the Pittsburg/Bay Point BART station and will include a large number of transit facilities (bus shelters, bus-only lanes, etc.). The internal circulation for both vehicles and pedestrians/bicyclists was designed in order to provide connectivity through the Master Plan area to the Pittsburg/Bay Point BART Station.

4.13.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Per Appendix G of the California Environmental Quality Act (CEQA) Guidelines and Bay Area Air Quality Management District (BAAQMD) recommendations, the City considers impacts related to climate change significant if implementation of the proposed project would result in any of the following:

1) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

2) Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

Thresholds of significance illustrate the extent of an impact and are a basis from which to apply mitigation measures. In June 2010, BAAQMD published its greenhouse gas threshold. If the proposed Master Plan would generate GHG emissions above the threshold level, it would be considered to contribute substantially to a cumulative impact and the impact would be considered significant. If mitigation can be applied to lessen the emissions such that the Master Plan meets its share of emission reductions needed to address the cumulative impact, the project would be considered less than significant.

BAAQMD does not have an adopted threshold of significance for construction-related GHG emissions. However, quantification and disclosure of construction-generated GHG emissions that would occur during construction is recommended.

BAAQMD's emission threshold for operations is 6.6 metric tons of CO_2 equivalent (CO_2e) per service population (residents plus employees) per year (BAAQMD 2010). The BAAQMD thresholds were chosen based on the substantial evidence that such thresholds represent quantitative and/or qualitative levels of GHG emissions, compliance with which means that the environmental impact of the GHG emissions will normally not be cumulatively considerable under CEQA (BAAQMD 2010). Compliance with such thresholds will be part of the solution to the cumulative GHG emissions problem, rather than hinder the state's ability to meet its goals of reduced statewide GHG emissions.

METHODOLOGY

GHG emission-related impacts were assessed in accordance with methodologies recommended by BAAQMD and in comparison to the recommended BAAQMD significance thresholds.

GHG emissions associated with the Master Plan were estimated for the GHGs that the California Air Resources Board finds are generated from indirect sources like the proposed project, including carbon dioxide (CO_2), nitrous oxide (N_2O), and methane (CH_4). Calculations of GHG emissions typically focus on CO_2 because it is the most commonly produced GHG in terms of number of sources and volume generated, and because it is among the easiest GHGs to measure. This analysis assesses N_2O and CH_4 emissions for other primary source categories of emissions (e.g., motor vehicles and energy use associated with long-term operation of the project). It is important to note that while other GHGs, such as hydrofluorocarbons (HFCs), have a higher global warming potential than CO_2, they emit negligible emissions from land use developments like the proposed project under typical operations.

URBEMIS 2007 was utilized to estimate the project's CO_2 emissions from construction. N_2O and CH_4 emissions resulting from project construction were analyzed using the California Climate Action Registry General Reporting Protocol Version 3.1 (January 2009). The General Reporting Protocol, produced by the California Registry and developed with the recommendations and technical and policy guidance from the California Energy Commission, is a document designed to support the accurate reporting of GHG emissions in a quantifiable manner. Climate change modeling is included as **Appendix J**.

URBEMIS 2007 was utilized on conjunction with the BAAQMD's Greenhouse Gas Model (BGM) to estimate the project's GHG emissions from area source, energy use, water and wastewater conveyance, solid waste generation, and mobile sources. BAAQMD developed this model to calculate GHG emissions not included in URBEMIS such as indirect emissions from electricity use and waste and direct fugitive emissions of refrigerants. The BGM also adjusts for state regulations not included in URBEMIS, specifically California's low carbon fuel rules and Pavley regulations.

IMPACTS AND MITIGATION MEASURES

AB 32 Compliance and GHG Emissions

Impact 4.13.1 Implementation of the proposed Master Plan would result in a net increase in greenhouse gas emissions that would not conflict with the goals of AB 32 or result in a significant impact on the environment. This impact is **less than cumulatively considerable.**

GHG emissions contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change. No single land use project could generate enough GHG emissions to noticeably change the global average temperature. The combination of GHG emissions from past, present, and future projects contributes substantially to the phenomenon of global climate change and its associated environmental impacts and as such is addressed only as a cumulative impact.

Emitting CO_2 into the atmosphere is not itself an adverse environmental effect. It is the increased concentration of CO_2 in the atmosphere resulting in global climate change and the associated consequences of climate change that results in adverse environmental affects (e.g., sea level rise, loss of snowpack, severe weather events). Although it is possible to generally estimate a project's incremental contribution of CO_2 into the atmosphere, it is typically not possible to determine whether or how an individual project's relatively small incremental contribution might translate into physical effects on the environment. Given the complex interactions between various global and regional-scale physical, chemical, atmospheric, terrestrial, and aquatic systems that result in the physical expressions of global climate change, it is impossible to discern whether the presence or absence of CO_2 emitted by a project would result in any altered conditions. When considered in the context of global or statewide GHG emissions, it is unlikely that any nonindustrial project would generate sufficient GHG emissions to be considered environmentally significant. GHG emissions are therefore considered a cumulative, rather than an individual, impact. This is not to suggest, however, that changes to individual projects may not, over the long term, result in lower GHG emissions.

Construction GHG Emissions

Subsequent development proposed under the Master Plan would result in direct emissions of GHGs from construction. The approximate quantity of daily GHG emissions generated by construction equipment utilized to build each phase of the Master Plan is depicted in **Table 4.13-3**. The table indicates that CO_2 would be the primary GHG emitted. Methane (CH_4) and nitrous oxide (N_2O) would also be emitted, but these emissions would be substantially less in volume, based on their emissions profile.

TABLE 4.13-3
CONSTRUCTION-RELATED CRITERIA POLLUTANT AND PRECURSOR EMISSIONS (POUNDS PER DAY)

Project Phase	Carbon Dioxide (CO2)	Nitrous Oxide (N2O)	Methane (CH4)	Hydrofluoro carbons (HFCs)	Perfluoro carbons (PFCs)	Sulfur Hexafluoride (SF6)	CO2e
Construction Phase 1							
2011	8,867	0.227	0.507	Negl.	Negl.	Negl.	8,948
2012	7,661	0.196	0.438	Negl.	Negl.	Negl.	7,731
2013	7,662	0.196	0.438	Negl.	Negl.	Negl.	7,732
2014	7,690	0.197	0.439	Negl.	Negl.	Negl.	7,760
2015	27	Negl.	Negl.	Negl.	Negl.	Negl.	27
Construction Phase 2							
2015	3,845	0.098	0.220	Negl.	Negl.	Negl.	3,880
2016	2,103	0.054	0.120	Negl.	Negl.	Negl.	2,122
2017	2,103	0.054	0.120	Negl.	Negl.	Negl.	2,122
2018	2,103	0.054	0.120	Negl.	Negl.	Negl.	2,122
Construction Phase 3							
2018	4,826	0.124	0.276	Negl.	Negl.	Negl.	4,870
2019	4,827	0.124	0.276	Negl.	Negl.	Negl.	4,871
2020	4,827	0.124	0.276	Negl.	Negl.	Negl.	4,871
2021	4,828	0.124	0.276	Negl.	Negl.	Negl.	4,872
2022	4,828	0.124	0.276	Negl.	Negl.	Negl.	4,872
Construction – West Coast Home Builders							
2022	11,561	0.296	0.661	Negl.	Negl.	Negl.	11,666
2023	11,561	0.296	0.661	Negl.	Negl.	Negl.	11,666
2024	11,561	0.296	0.661	Negl.	Negl.	Negl.	11,666
2025	11,607	0.297	0.663	Negl.	Negl.	Negl.	11,713
2026	11,611	0.297	0.664	Negl.	Negl.	Negl.	11,717
Construction Phase 4							
2026	2,687	0.069	0.154	Negl.	Negl.	Negl.	2,711
2027	2,974	0.076	0.170	Negl.	Negl.	Negl.	3,001
2028	2,974	0.076	0.170	Negl.	Negl.	Negl.	3,001
2029	2,974	0.076	0.170	Negl.	Negl.	Negl.	3,001
Construction Phase 5							
2029	2,687	0.069	0.154	Negl.	Negl.	Negl.	2,711
2030	5,251	0.135	0.300	Negl.	Negl.	Negl.	5,299
2031	5,251	0.135	0.300	Negl.	Negl.	Negl.	5,299

Note: Negl. = Emissions of this GHG would be negligible from this source category (less than 0.06 pounds per day)
*Source: California Climate Action Registry General Reporting Protocol Version 3.1 (January 2009). (see **Appendix I**)*

Table 4.13-3 above illustrates the construction-related GHG emissions that would result from each construction phase of the proposed Master Plan. It is important to note that the land use designations of the Master Plan area include a variety of development types and densities and those used for the purpose of this analysis are based on assumptions (see Section 4.0). The assumptions used to project the assumed buildout and construction phases are based on historic development data, weighted toward residential uses. However, certain considerations are expected to come into play during later development of the Master Plan area that could deviate from this set of assumptions depending on future market conditions and demand. The amount of GHG emissions generated during construction of individual phases would vary depending on numerous factors, and the projected emissions identified in **Table 4.13-3** are only estimates based upon the assumption methodology described in Section 4.0.

While BAAQMD does not have an adopted significance threshold for construction-related GHG emissions, estimated GHG emissions that would occur during construction are disclosed in order to assist in the determination of significance for GHG emission impacts in relation to meeting AB 32 GHG reduction goals. In addition, BAAQMD recommends that all construction projects incorporate best management practices.

The Master Plan includes in its design standards (and other applicable portions of the plan) the following best management practices (BMPs) for construction:

- Alternative-fueled (e.g., biodiesel, electric) construction vehicles/equipment of at least 15 percent of the fleet;
- Local building materials (within 100 miles) of at least 10 percent; and
- Recycle at least 50 percent of construction waste or demolition materials.

It is anticipated that these BMPs will reduce construction-based impacts to a **less than cumulatively considerable** impact.

Operational GHG Emissions

As shown in **Table 4.13-4**, below, the long-term operations of the proposed project would produce 23,653 metric tons of CO_2e annually, primarily from motor vehicles that travel to and from the site.

TABLE 4.13-4
ESTIMATED GREENHOUSE GAS EMISSIONS – MASTER PLAN OPERATION (BUILDOUT) (METRIC TONS PER YEAR)

Emission Source		Carbon Dioxide (CO2)	Methane (CH4)	Nitrous Oxide (N2O)	Hydrofluorocarbons (HFCs)	Perfluorocarbons (PFCs)	Sulfur Hexa-fluoride (SF6)	CO2e
Mobile Source[1,2] (vehicle)		N/A	N/A	N/A	N/A	N/A	N/A	17,184.52
Area Source (landscaping, hearth)		561.47	2.02	0.00	Negl.	Negl.	Negl.	606.57
Stationary Source	Electricity	2,772.52	0.02	0.01	Negl.	Negl.	Negl.	2,776.96
	Natural Gas	1,477.76	0.14	0.00	Negl.	Negl.	Negl.	1,481.55
Water and Wastewater Conveyance		152.01	0.00	0.00	Negl.	Negl.	Negl.	152.01
Solid Waste		10.61	68.62	N/A	Negl.	Negl.	Negl.	1,451.61
Conversion of Emissions into carbon dioxide equivalents (CO2e), which weight each gas by its global warming potential								
Total CO_2e Emissions	**23,653.22 CO_2e Emissions**							

*Source: URBEMIS ver. 9.2.4; BAAQMD BGM Greenhouse Gas Calculator v. 1.1.9 (see **Appendix I**), unless otherwise noted below.*
Notes: Negl - Emissions of this GHG would be negligible from this source category (less than 0.01 metric tons per year).
N/A – Not available through BGM
1. Emissions presented are adjusted for future improved CAFÉ standards (Pavley I) and Low Carbon Fuel Standards.
2. Source: Vehicle Miles Traveled from Fehr & Peers 2010.

BAAQMD's emission threshold is 6.6 metric tons of CO_2e per service population (residents plus employees) per year (BAAQMD 2010). The BAAQMD thresholds were chosen based on the substantial evidence that such thresholds represent quantitative and/or qualitative levels of GHG emissions, compliance with which means that the environmental impact of the GHG emissions will normally not be cumulatively considerable under CEQA (BAAQMD 2010). Compliance with such thresholds will be part of the solution to the cumulative GHG emissions problem.

The analysis presented in this section is based on building and vehicle standards based on currently existing policies and practices. Any future adoption of a Climate Action Plan and corresponding policies and standards would be expected to result in lower projected emissions from each of the listed sources than what is described herein. Future development proposals within the Master Plan Area will be subject to any City policies and standards relative to GHGs that have been adopted at the time the application is submitted. It is likely that the City's Climate Action Plan will find that thresholds equal or lower than the BAAQMD GHG emissions thresholds will be required for local emissions reductions consistent with AB 32. Compliance with local GHG reduction measures in new development is critical to ensuring the City's ability to meet GHG reduction goals consistent with State and regional goals. However, as these eventual requirements and their resulting effects on future GHG impacts cannot be known with any certainty, the analysis presented herein does not include any

TABLE 4.13-5
MASTER PLAN GREENHOUSE GAS EMISSIONS PER SERVICE POPULATION

Per Capita Emissions	Emissions	Jobs	Population	Service Population (SP)	MTCO2e/SP/Year
Master Plan Buildout	23,653	1,300	3,738	4,935	4.79

Based on the population and employment figures listed in **Table 4.13-5** above, the projected buildout service population would be 4,935 under the proposed Master Plan. Dividing the GHG emissions for buildout yields a metric ton per service population ratio of 4.79 for buildout conditions. As this is less than the BAAQMD threshold of 6.6, the proposed project would improve GHG emissions per service population and would not result in a net increase in cumulative GHG emissions. The proposed Master Plan's contribution to GHGs is thus considered **less than cumulatively considerable**.

Mitigation Measures

None required.

REFERENCES

Bay Area Air Quality Management District (BAAQMD). 2006. *Source Inventory of Bay Area Greenhouse Gas Emissions.*

———. 2010. *California Environmental Quality Act Guidelines.*

California Air Resources Board (CARB). 2004. *Climate Change Emissions Control Regulations*.

———. 2010. *California Greenhouse Gas Inventory for 2000–2008.* http://www.arb.ca.gov/cc/inventory/data/data.htm

California Climate Action Registry. 2009. *California Climate Action Registry General Reporting Protocol Version 3.1.* January 2009.

California Energy Commission (CEC). 2008. *Building Energy Efficiency Standards for Residential and Nonresidential Buildings.* http://www.energy.ca.gov/title24/

California Natural Resources Agency (CNRA). 2009. *2009 California Climate Adaptation Strategy*.

City of Pittsburg. 2001. *City of Pittsburg General Plan 2020: Draft Environmental Impact Report.*

———. 2009. *Draft 2005 Greenhouse Gas Emissions Inventory*.

European Fluorocarbons Technical Committee (EFCTC). 2003. *Fluorocarbons and Sulphur Hexafluoride: Perfluorocarbons (PFCs) Fact Sheet*. http://www.fluorocarbons.org/en/info/brochures/ fact_10.html.

Fehr & Peers. 2010, December. Personal communication from Sam Tabibnia, Fehr & Peers, to Kevin Freibott, PMC. Vehicle Miles Traveled for proposed project.

San Francisco Bay Conservation and Development Commission (BCDC). 2009. (April) Draft Staff Report. *Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on its Shoreline.* http://www.bcdc.ca.gov/planning/climate_change/climate_change.shtml.

U.S. Environmental Protection Agency (EPA). 2006a. *Methane*. http://www.epa.gov/methane/index.html

———. 2006b. *Nitrous Oxide*. http://www.epa.gov/nitrousoxide/index.html

———. 2006c. *High Global Warming Potential Gases*. http://www.epa.gov/highgwp/scientific.html

———. 2008. *Climate Change – Greenhouse Gas Emissions: Carbon Dioxide*.

———. 2008b. SF6 Emission Reduction Partnership for Electric Power Systems: Basic Information. http://www.epa.gov/electricpower-sf6/basic.html

———. 2010a. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2008.*

———. 2010b. *PSD and Title V Permitting Guidance for Greenhouse Gases*.

5.0 Cumulative Impact Summary

This section summarizes the cumulative impacts associated with the proposed Master Plan using the same environmental issue areas as Section 4.0. Cumulative impacts are the result of combining the potential effects of the project (i.e., the proposed Master Plan) with other existing, approved, proposed, and reasonably foreseeable development projects in the region. The following discussion considers the cumulative impacts of the relevant environmental issue areas.

5.1 INTRODUCTION

The California Environmental Quality Act (CEQA) requires that an environmental impact report (EIR) contain an assessment of the cumulative impacts that could be associated with the proposed project. According to CEQA Guidelines Section 15130(a), "an EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable." *Cumulatively considerable* means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (as defined by Section 15130). As defined in CEQA Guidelines Section 15355, a cumulative impact is an impact created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. A cumulative impact occurs from:

> . . . the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

In addition, Section 15130(b) identifies the following elements as necessary for an adequate cumulative impact analysis:

1) Either:

   (A) A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency; or,

   (B) A summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area-wide conditions contributing to the cumulative impact. Any such planning document shall be referenced and made available to the public at a location specified by the lead agency.

2) A definition of the geographic scope of the area affected by the cumulative effect and a reasonable explanation for the geographic limitation used;

3) A summary of the expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available; and

4) A reasonable analysis of the cumulative impacts of the relevant projects. An EIR shall examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

Where a lead agency is examining a project with an incremental effect that is not cumulatively considerable, a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable.

APPROACH TO THE CUMULATIVE IMPACT ANALYSIS

The analysis of cumulative impacts for each environmental factor can employ one of two methods to establish the effects of other past, current, and probable future projects. A lead agency may select a list or projects, including those outside the control of the agency, or alternatively, a summary of projects. These projects may be from an adopted general plan or related planning document, or from a prior environmental document that has been adopted or certified, and they may describe or evaluate regional or area-wide conditions contributing to the cumulative impact. The analysis provided in this Draft Environmental Impact Report (DEIR) utilizes both approaches.

Definition of Cumulative Setting

The cumulative setting conditions considered in this DEIR are based on:

- **City of Pittsburg General Plan** – The City's General Plan guides local land use in the City of Pittsburg and provides a framework within which future development is expected to occur. The General Plan was analyzed for its guidance and requirements applicable to each section of this DEIR, and the assumptions contained within were incorporated into the cumulative analysis presented in the technical sections of this DEIR (Sections 4.1 through 4.13) as well as this section.

- **Large-Scale Development Projects** – Sourced from the City's "Project Pipeline" as well as through coordination with the County of Contra Costa, a list of major development projects expected to occur within the vicinity of the proposed project was considered as part of the Cumulative Setting. See Section 4.0, Assumptions, for a listing of these projects and their expected buildout conditions.

- **Recent Environmental Documentation** – For those projects which have been approved but have not yet built out, such as the Alves Ranch project, CEQA documents prepared and certified by the City and the County were used to anticipate future development on those sites. Likewise, the Pittsburg/Bay Point BART Station Area Specific Plan EIR, prepared by the County and City in conjunction with BART (SCH 1998022071), was analyzed as it is expected to guide future development in the portions of the Specific Plan that lie outside the City of Pittsburg. As the City has not adopted this Specific Plan nor certified the EIR, it was not considered to guide future development in those portions of the Specific Plan area that lie within the incorporated city boundary.

- **Effect of Regional Conditions** – The cumulative setting considers background traffic volumes and patterns on regional and state highways (e.g., State Route [SR] 4), background air quality conditions, and other associated environmental conditions that occur within the region, both inside and outside the immediate vicinity of the Master Plan.

- **Consideration of Service Provider Planning** – In the case of services and utilities, the planning of those agencies that provide the services/utilities was considered and applied to the assumptions of the cumulative setting. For example, future water supply planning by the Contra Costa Water District (CCWD) was utilized in determining cumulative water supply need and expected customer load.

Each technical section of the Draft EIR includes a description of the geographic setting in the context of cumulative impacts based on the characteristics of the environmental issue under consideration as set forth in Section 15130(b) of the State CEQA Guidelines. For some issues, such as air quality, this area is very large, often extending over city and county lines to other parts of the Bay Area.

5.2 CUMULATIVE IMPACTS ANALYSIS

This subsection provides an analysis of overall cumulative impacts of the proposed Master Plan taken together with other past, present, and probable future projects producing related impacts, as required by Section 15130 of the CEQA Guidelines. The goal of such an exercise is twofold: first, to determine whether the overall long-term impacts of all such projects would be cumulatively significant; and second, to determine whether the proposed project itself would cause a cumulatively considerable (and thus significant) incremental contribution to any such cumulatively significant impacts. (See CEQA Guidelines Section 15130[a]–[b], Section 15355[b], Section 15064[h], Section 15065[c]; *Communities for a Better Environment v. California Resources* Agency [2002] 103 Cal.App.4th98, 120.) In other words, the required analysis intends to create a broad context in which to assess the proposed project's incremental contribution to anticipated cumulative development impacts, viewed on a geographic scale well beyond the project site itself, and then to determine whether the project's incremental contribution to any significant cumulative impacts from all projects is itself significant (i.e., cumulatively considerable in CEQA parlance).

Pursuant to Section 15130 of the CEQA Guidelines, "(t)he discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by the standards of practicality and reasonableness, and should focus on the cumulative impacts to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact." The proposed project is considered to have a significant cumulative effect if:

1) The cumulative effects of development without the project are not significant and the project's additional impact is substantial enough, when added to the cumulative effects, to result in a significant impact; or

2) The cumulative effects of development without the project are already significant and the project contributes measurably to the effect. The term "measurably" is subject to interpretation. The standards used herein to determine measurability are that either the impact must be noticeable to a reasonable person, or must exceed an established threshold of significance.

Identified below is a summary of the cumulative impacts that would result from the implementation of the proposed Master Plan and future development in the vicinity. The following cumulative impacts of the proposed project are specifically identified in Sections 4.1 through 4.13 of this Draft EIR. The reader is referred to the various environmental issue areas of these sections for further details and analysis of the cumulative impacts.

4.1 LAND USE AND PLANNING

Impact 4.1.2 Implementation of the proposed project, in combination with existing, approved, proposed, and reasonably foreseeable development, would result in development that would change existing land uses patterns and intensity. As this change was anticipated in the General Plan, this impact is considered **less than cumulatively considerable.**

4.2 POPULATION, HOUSING AND EMPLOYMENT

Impact 4.2.2 Development of the proposed project, in combination with other approved, planned, or potential future projects, would contribute to additional population residing and working in the vicinity through the addition of new employment opportunities and residential units. This is a **less than cumulatively considerable** impact.

4.3 HAZARDS

Impact 4.3.4 Implementation of the proposed project, in addition to existing, approved, proposed, and reasonably foreseeable development in the area, would contribute to an increase in potential conflicts with emergency response plans and wildland fire hazards. Considering site-specific conditions, this is considered a **less than cumulatively considerable** impact.

4.4 TRANSPORTATION AND TRAFFIC

Impact 4.4.5 The proposed Master Plan may cause an increase in traffic that is substantial in relation to the cumulative traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or reduction in level of service) during the cumulative plus project condition. This impact is **cumulatively considerable**.

4.5 NOISE

Impact 4.5.6 Implementation of the proposed project would not result in a substantial contribution to cumulative noise levels. The impact would be considered **less than cumulatively considerable.**

4.6 AIR QUALITY

Impact 4.6.7 Implementation of the proposed Master Plan, in combination with cumulative development in the SFBAAB, would result in a cumulatively considerable net increase of ozone and coarse and fine particulate matter. This is considered a **cumulatively considerable** impact.

4.7 GEOLOGY AND SOILS

Impact 4.7.5 Development described by the proposed Master Plan in addition to other proposed and approved project in the vicinity would not result in creation or exacerbation of any identified geological or soils impacts. This impact is considered **less than cumulatively considerable.**

4.8 HYDROLOGY AND WATER QUALITY

Impact 4.8.4 The proposed project, in combination with existing, approved, proposed, and reasonably foreseeable development, would not contribute to the cumulative effects of degradation of regional water quality, changes to runoff patterns, or the potential for increased flooding. This would be a **less than cumulatively considerable** impact.

4.9 BIOLOGICAL AND NATURAL RESOURCES

Impact 4.9.8 Implementation of the proposed project, in combination with existing, approved, proposed and reasonably foreseeable development, could result in the conversion of habitat and impact biological resources. This impact is considered **cumulatively considerable**.

4.10 AESTHETICS

Impact 4.10.5 Development in the Master Plan area, together with reasonably foreseeable development in areas immediately adjacent to the Master Plan area, may have a cumulative impact on visual quality. This impact is considered **less than cumulatively considerable.**

4.11 PUBLIC SERVICES AND UTILITIES

Impact 4.11.1.2 Implementation of the proposed Master Plan, in combination with other reasonably foreseeable development, would increase the number of accidents, calls, and responses within the CCCFPD service area and require additional fire services. However, this impact would be **less than cumulatively considerable**.

Impact 4.11.2.2 The proposed Master Plan, in addition to proposed and reasonably foreseeable development, would increase the demands on the City of Pittsburg Police Department and BART Police, and require additional law enforcement services under cumulative conditions. This would be a **less than cumulatively considerable** impact.

Impact 4.11.3.2 Implementation of the proposed Master Plan, as well as potential development within the cumulative setting area, would result in cumulative public school impacts. These cumulative public school impacts are considered **less than cumulatively considerable**.

Impact 4.11.4.3 Implementation of the proposed Master Plan, in combination with cumulative development in the City of Pittsburg, would increase the current demand for CCWD water supply. This increase in demand was anticipated by both CCWD and the City of Pittsburg, resulting in a **less than cumulatively considerable** impact.

Impact 4.11.5.2 Implementation of the proposed Master Plan, in combination with foreseeable development in the area, would not result in a cumulative demand for wastewater treatment capacity that could require additional wastewater facilities. This would be a **less than cumulatively considerable** impact.

Impact 4.11.6.2 The proposed project would contribute to cumulative demands for solid waste disposal services. This would be a **less than cumulatively considerable** contribution to the cumulative impact.

Impact 4.11.7.3 Implementation of the proposed Master Plan, as well as potential development in the surrounding areas, would result in an increase in cumulative utility service demands. The proposed Master Plan would have a **less than cumulatively considerable** impact on electrical, natural gas, telephone, and cable television services.

4.12 RECREATION

Impact 4.12.2 Implementation of the proposed Master Plan, in conjunction with other future development, would not require additional park and recreation facilities within the boundaries of the city. This impact would be **less than cumulatively considerable**.

4.13 CLIMATE CHANGE AND GREENHOUSE GASES

Impact 4.13.1 Implementation of the proposed Master Plan would result in a net increase in greenhouse gas emissions that would not conflict with the goals of AB 32 or result in a significant impact on the environment. This impact is **less than cumulatively considerable.**

6.0 Alternatives to the Project

6.1 INTRODUCTION

GENERAL CEQA REQUIREMENTS

CEQA Guidelines Section 15126.6(a) states "an EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives." The EIR need not consider every conceivable alternative, but rather consider a "reasonable range" of potentially feasible alternatives that will foster informed decision-making and public participation. The range of potential alternatives to the proposed project shall include those alternatives that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects (CEQA Guidelines Section 15126.6(c)).

PROJECT OBJECTIVES

As described in Section 3.0, Project Description, the proposed Master Plan was created to meet the following objectives:

1. Establish the BART station area as a regional focal point;
2. Reduce greenhouse gas emissions and automobile trips by promoting sustainable development characterized by a mix of uses and a circulation system that prioritizes pedestrians, bicyclists, and transit riders over single-occupancy vehicles;
3. Increase transit ridership by developing a multimodal transit hub;
4. Improve security on the BART property and in the surrounding community by increasing the eyes on the street through increased density and implementing crime prevention through environmental design principles and improved access and connectivity;
5. Foster healthy lifestyles by supporting walking and bicycling and improving pedestrian and bicycle linkages to/from the BART station;
6. Support economic development by facilitating access to existing commercial development and by providing commercial and retail development to support BART patrons, new residents of the transit-oriented development (TOD), and residents of the surrounding neighborhoods;
7. Maintain flexibility in the plan by creating a "flex space" land use designation that can be used as future commercial, office, or residential uses, depending on future market conditions and demand;
8. Improve employment opportunities for local residents by increasing commercial development and supporting and linking to existing commercial uses around the station;
9. Support a range of housing types to support the diverse needs of the community and maximize housing opportunities for all income levels, age groups, and abilities;
10. Create attractive, usable, and inviting public spaces; and

11. Build a sense of community and of place through good architecture and design of public and private spaces.

SUMMARY OF SIGNIFICANT EFFECTS

The analysis presented in the technical sections of this DEIR (Sections 4.1 through 4.13) found several significant impacts which would result from implementation of the Master Plan. These significant impacts were:

- Cumulative Traffic Impacts. While most intersections studied in the DEIR would operate acceptably under cumulatively conditions, the proposed Master Plan along with projected future development would result in unacceptable conditions at the following intersections:
  - San Marco Boulevard and SR 4 eastbound ramps;
  - West Leland Road, Oak Hills Drive, D Street intersection;
  - Bailey Road and Willow Pass Road intersection; and,
  - Bailey Road/Myrtle Drive and Bailey Road/Concord Boulevard intersections.
- Groundborne Vibration. Construction of the parking garages may expose persons and nearby structures to temporary, construction-related groundborne vibration.
- Operational Air Quality (non-GHG) Emissions. Operation of uses developed as part of the Master Plan would emit criteria pollutants in amounts greater than established thresholds.
- Cumulative Air Quality (non-GHG) Emissions. The proposed Master Plan in combination with other growth in the cumulative area is expected to result in cumulatively considerable emissions of criteria pollutants over time.

ALTERNATIVES ANALYZED IN THE EIR

Three alternatives to the proposed project are analyzed in this DEIR and are described below.

Alternative 1 – No Project Alternative. Under this alternative, no development of the Master Plan area would occur beyond what is currently located there, namely the surface parking, bus shelters, single retail structure, Bay Area Rapid Transit (BART) station appurtenances, and detention basin. The West Coast Home Builders (WCHB) property would remain in its current undeveloped state. This alternative would not meet the objectives of the proposed project or the City of Pittsburg General Plan. However, analysis of the No Project Alternative is required under CEQA Guidelines Section 15126.6(e).

Alternative 2 – Existing BART Development Plus WCHB Project Alternative. This alternative assumes that the BART property remains in its current state, but the currently vacant WCHB property would build out as expected under the Master Plan. As the Master Plan land use plan and other requirements were developed in consideration of the preliminary materials provided previously by WCHB, it is assumed under Alternative 2 that the development of the WCHB property would be consistent with that preliminary application and would thus include approximately 748 multi-family dwelling units constructed in several three-story buildings with a central private recreation/open space component. Likewise, it is assumed that increasing the impervious surfaces on the site, namely through paving of streets and other hardscape as well as the construction of buildings, would necessitate some expansion of the existing stormwater retention basin.

Alternative 3 – Reduced Development Potential Alternative. This alternative would retain the same overall site design. However, development standards would be modified to limit building heights to three stories, similar to other multi-family development in the project vicinity. This modification would result in approximately 340 fewer residential units and approximately 63,000 fewer square feet of nonresidential development. Because the parking needs of the BART station and bus shelters would remain unchanged, Alternative 3 assumes that the parking garages will remain as proposed—six stories for Garage 1 and five stories for Garage 2.

6.2 ALTERNATIVES CONSIDERED BUT REJECTED

CEQA Guidelines Section 15126.6(c) states that an EIR should identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination. Additional information explaining the choice of alternatives may be included in the administrative record. Among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are (1) failure to meet most of the basic project objectives, (2) infeasibility, or (3) inability to avoid significant environmental impacts.

The land use development alternative that was considered but rejected consists of the following:

Alternative Site – The possibility of placing the proposed project on an alternative site within the City of Pittsburg was not feasible. No other sites are available in the city for transit-oriented development (TOD). The only other station area which could accommodate the proposed project and would be appropriate for TOD development would be the planned eBART extension, for which there already exists an approved plan for mixed-use TOD. Additionally, placement of mixed-use development such as that proposed by the Master Plan in any other location would be inconsistent with the goals and policies of the Pittsburg General Plan. This, in addition to the fact that the majority of project objectives concern the BART station directly or the ancillary needs and goals of the BART station, it was determined that an alternative site was not feasible.

Limit Residential Development Outside TAC Area – This alternative considered placing all residential uses in the Master Plan Area outside the 900-foot buffer from SR 4 recommended by the Bay Area Air Quality Management District (BAAQMD). As the Master Plan is itself approximately 990 feet deep, this would be largely infeasible due to the severely limited area available for residential development, and the fact that residential development is largely considered the most feasible development in this market. Furthermore, reconfiguring the site plan to locate residential uses along the southern boundary of the Master Plan Area would position the parking garages prominently along the northern portion of the site allowing drivers to park vehicles as close as possible to the BART entrance without circulating through or interacting with the station area commercial development. This arrangement would prevent the pedestrian circulation essential to success of the proposed commercial and flex areas resulting in economic effects that would prevent the Master Plan from attaining many of the objectives outlined for the project. For these reasons, limiting residential uses outside the

900-foot buffer area was determined to be infeasible and will not be addressed further herein.

6.3 COMPARATIVE IMPACT ANALYSIS

For each project alternative, the significant environmental impacts are identified, as well as the impacts of the proposed project that would be avoided. If an alternative would cause one or more significant effects in addition to those that would be caused by the proposed project, the significant effects of the alternative are discussed, but in less detail than the significant effects of the proposed project (CEQA Guidelines Section 15126.6(d)). The discussion for each alternative addresses potential impacts on each of the environmental issues presented in Section 4.0 of this DEIR. If a potential impact under an alternative is similar to that under the proposed project, the discussion will so note and no further analysis of the potential impact is conducted.

While analysis of alternatives under CEQA is neither required nor meant to be as detailed as the analysis of the project as proposed, pursuant to State CEQA Guidelines section 15126.6(d), some attempt at quantifying the impact of each alternative is appropriate and can inform decision-makers as to the comparative impacts of each alternative. To this end, the development assumptions discussed in Section 4.0, Assumptions, have been applied to each of the alternatives to arrive at an expected development intensity for each.

In the case of Alternative 1, zero development would result in zero growth. However, a specific number of dwelling units, employees, and square feet of noncommercial development was required for Alternatives 2 and 3 to provide some quantitative discussion of impacts. Intensity of Alternative 2 assumed full development of the WCHB property and no development of the existing BART facilities. This was calculated by taking WCHB's contribution to the overall project buildout and assuming that contribution would be the only growth under Alternative 2.

For Alternative 3, in which the Master Plan is developed but limited to three stories maximum height, a reduction factor was applied to assumed development to account for the loss in building height. In the case of the Master Plan as proposed, height limits have not been placed on individual structures. However, the expected eventual height of structures was developed according to the dwelling units and square footage of nonresidential development expected of the Master Plan. For development of the proposed Master Plan, it was expected that development would require medium-density structures of approximately four stories in height, high-density residential would average five stories in height, and flex uses would likewise average five stories in height. Development intensities were reduced proportionally for Alternative 3 based on the number of stories lost (i.e., ¾ of dwelling units per acre for medium-density residential, etc.). Retail uses were left untouched as they are assumed to occur on the first floor and would thus not be affected by the reduction in building height.

For each alternative, the development intensity assumptions were applied to the acres of each land use that would be developed to determine an assumed buildout for each. The results of this calculation are shown in **Table 6.0-1** below.

TABLE 6.0-1
BUILDOUT ASSUMPTIONS OF ALL ALTERNATIVES

Development	Proposed Master Plan	Alternative 1 No Project	Alternative 2 WCHB Only	Alternative 3 Reduced Height
Dwelling Units	1,168	0	748	828
Population[1]	3,738	0	2,394	2,650
Employees	1,300	0	0	845
Sq. Ft. Nonresidential	146,362	0	0	83,287

Notes: [1]*Population calculated according to 2010 average persons per household in Pittsburg. See Section 4.2, Population, Housing, and Employment, for more information.*

Overall, Alternative 2 would develop 36 percent less residential and 100 percent less nonresidential uses than the Master Plan as proposed. Alternative 3 would develop 29 percent less residential and 43 percent less nonresidential development.

The assumptions shown in **Table 6.0-1** above were utilized in formulating the following analysis of comparative impacts. For the purposes of comparison, each alternative is labeled as either having a Worse, Similar, or Reduced environmental effect when compared with the Master Plan as proposed.

LAND USE AND PLANNING

Alternative 1 – Similar

As with the proposed project, Alternative 1 would not be expected to have any significant land use impacts. While the General Plan calls for mixed-use development of the Master Plan area, not approving the proposed Master Plan would not preclude future development from occurring on the site that is consistent with the General Plan designation for the project area.

Alternative 2 – Similar

Alternative 2 would include residential development on the WCHB site, anticipated both by the City and by other entities such as Contra Costa County and BART. As such, Alternative 2 would result in less than significant land use impacts.

Alternative 3 – Similar

Alternative 3 is most similar to the proposed Master Plan because mixed-use development would still occur, though at a reduced intensity than that expected of the proposed Master Plan. As such, land use impacts would be less than significant.

POPULATION, HOUSING, AND EMPLOYMENT

Alternative 1 – Reduced

Unlike the proposed Master Plan, Alternative 1 would include no additional development of residential or nonresidential uses. According to the analysis presented in Section 4.0 of this DEIR, the proposed Master Plan's only significant population and housing impact would be a result of the direct growth created by the project as it develops. As Alternative 1 includes no development, this growth would not occur and there would be no impact.

Alternative 2 – Similar

As with the proposed Master Plan, Alternative 2 would be expected to result in the addition of homes to the city, which would result in population growth and ancillary effects that occur along with growth, such as increased demand for resources, additional traffic, etc. As with the proposed Master Plan, growth has been anticipated on this site by the General Plan and other local planning. Regardless, Alternative 2 would result in significant growth and the impact would be significant, similar to the proposed Master Plan.

Alternative 3 – Similar

Alternative 3 would have similar physical characteristics to the proposed Master Plan save for reduced building heights. Regardless of the lower building heights, Alternative 3 would be expected to result in growth on a currently vacant and unoccupied site (save for parking and minor BART facilities). As such, the impact of Alternative 3 would be significant and similar to the proposed Master Plan.

HAZARDS

Alternative 1 – Reduced

Alternative 1 would result in no functional change to the Master Plan area. As such, no additional residents or employees would reside/work in the Master Plan area and thus no impact related to hazards would occur. However, as the proposed project includes no significant unmitigable impacts related to hazards, the net change is minimal.

Alternative 2 – Similar

Alternative 2 would place additional homes and thus additional residents on the currently undeveloped site. As such, the hazards identified for the proposed project, specifically effects to emergency access and the risk of wildland fire, would still be a concern. In regard to emergency plans, the WCHB site would be developed with an internal roadway system identical in physical characteristics to that expected of the proposed Master Plan. As such, the impact on emergency response plans would be identical—less than significant. Similarly, the risk of wildland fire is dependent more on the fact that development would occur than on the style or intensity of that development. As such, Alternative 2 would place homes in an area of risk for wildland fire (that is, until Alves Ranch develops), and it is anticipated that mitigation would be sufficient to reduce that hazard to a less than significant level.

Alternative 3 – Similar

As with Alternative 2, Alternative 3 would include the same internal roadway network, resulting in the same impact related to emergency response plans. Similarly, Alternative 3 would place homes next to the vacant Alves Ranch development, resulting in the same less than significant wildland fire impact. As such, Alternative 3 would have functionally identical hazards impacts when compared with the proposed Master Plan.

TRANSPORTATION AND TRAFFIC

Alternative 1 – Reduced

As Alternative 1 would include zero development, no construction traffic effects would occur and no contribution to existing traffic loads would be generated. Tempering this substantial reduction, however, would be the fact that without the TOD aspects of the proposed Master Plan and the bicycle/pedestrian improvements planned for it, no local reduction in vehicle miles traveled (VMT) would occur and the property would continue to be inconsistent with alternative transportation plans and policies of the City's General Plan. This would not, however, offset the benefits to local vehicle traffic.

Alternative 2 – Similar

While Alternative 2 would represent a reduction in overall development, it is logical to assume a reduction in VMT from the proposed Master Plan would result. However, Alternative 2 would still include a substantial increase in residents and VMT over existing conditions. Construction traffic impacts would be largely similar to those expected of the proposed Master Plan as these are a function of any construction and not very dependent on type, style, or intensity of final use. Likewise, while VMT and trip generation would likely be incrementally less, the potential impact on the Bailey Road/West Leland Road intersection would remain significant. As with Alternative 1, Alternative 2 would not include the bicycle and pedestrian facilities proposed on the eastern (BART-owned portion) of the Master Plan. Some local reduction in VMT and trips would occur as residents of the WCHB property walk/bike to the BART station, but there would be less overall benefit than that expected of the proposed Master Plan. Lastly, the several intersections expected to have cumulative traffic issues under the proposed Master Plan would likely still have those issues with Alternative 2, though proportionally smaller.

Alternative 3 – Similar

Because the uses and layout of Alternative 3 are identical to the proposed Master Plan, Alternative 3 would have largely the same impacts due to construction traffic issues, site circulation, alternative transportation, and cumulative effects. Because the existing plus project traffic impact is really limited to Bailey Road/West Leland Road, in very close proximity to the Master Plan area, this impact would remain significant and unavoidable, albeit proportionally less due to the reduction in housing units and population. Likewise, cumulative impacts would remain significant.

NOISE

Alternative 1 – Reduced

As Alternative 1 does not include any construction activities, identified noise impacts from construction would not occur. Similarly, groundborne vibration issues that are significant and require mitigation for the proposed Master Plan would not occur. Operational noises that were identified as significant for the proposed Master Plan, including parking garage noise and noises sourced from retail and commercial uses, would not occur as these uses would not be constructed. The analysis of the Master Plan also included noise impacts from buses and transit vehicles. As Alternative 1 would allow these operations to continue at the existing BART station, these impacts would still occur under this alternative. As with the other areas of noise concern, land use compatibility impacts would not occur under Alternative 1 because no noise-sensitive land uses would be constructed in the Master Plan area.

Alternative 2 – Reduced

As with Alternative 1, Alternative 2 would not include construction and operation of significant sources of noise such as the parking garages and nonresidential uses. While homes would be constructed, multi-family residential was not identified in the noise analysis as generating any significant noise. Residential uses constructed on the WCHB site as part of Alternative 2 would place homes in close proximity to the bus and transit noise generated by the existing BART facilities. As such, this impact would be similar to that expected of the proposed Master Plan. As with the proposed Master Plan, it is anticipated that this impact would be mitigable to a less than significant impact. Furthermore, this alternative would not include the construction of parking garages, identified as a potential source of short-term groundborne vibration impacts.

Alternative 3 – Similar

While Alternative 3 would reduce building heights and thus development intensity, the same types of uses would be constructed, and in the same areas proposed under the Master Plan Land Use Plan. Additionally, Alternative 3 includes the same parking garages as included in the proposed Master Plan, resulting in the same construction-related and operational noise generation. While Alternative 3 would result in a reduced number of people who would be affected by noise generated by the uses of the Master Plan, the impact would occur. Local noise standards are not dependent on the number of people affected, rather that the effect occurs. As such, Alternative 3 would have similar impacts to those identified for the proposed Master Plan. As with the proposed Master Plan, groundborne vibration impacts from the construction of parking garages under Alternative 3 would still be potentially significant and unavoidable. As with the proposed Master Plan, implementation of recommendations contained in future geotechnical studies may allow this impact to be mitigated.

AIR QUALITY

Alternative 1 – Reduced

Alternative 1 would place no additional development within the Master Plan area. As such, no construction would occur and no additional uses would be constructed that could emit operational pollutants. As no residents would be housed on the property, the vicinity of diesel toxic air contaminants (TACs) from State Route (SR) 4 would have no effect.

Alternative 2 – Similar

As Alternative 2 would include a reduced amount of development overall, it is anticipated that operational emissions and construction emissions would be reduced. However, development of the WCHB property was the only phase of development projected to exceed construction emissions thresholds; therefore, this impact would likely remain significant but mitigable. In regard to operational emissions, Alternative 2 would result in approximately 36 percent less residential vehicle miles traveled (VMT) and no nonresidential VMT over that existing currently. It is expected that Alternative 2 as a whole would result in 36,310 additional VMT, which is higher than the projected population growth citywide (33,833 persons). Therefore, operational impacts would remain significant and unavoidable. Likewise, Alternative 2 would still result in placement of residential uses within the 500-foot identified TAC set-back adjacent to SR 4, a significant but mitigable impact.

Alternative 3 – Similar

Alternative 3 would include reduced development that would similarly reduce VMT increases. The alternative would include development of the WCHB property, which is expected to generate significant though mitigable construction impacts. Alternative 3 would be expected to generate 29 percent less residential VMT and 43 percent less nonresidential VMT, resulting in approximately 68,900 additional VMT, well above the projected city population growth. Thus, operational impacts would remain significant and unavoidable under Alternative 3. Likewise, Alternative 3 would continue to result in placement of residential uses within the 500-foot identified TAC set-back adjacent to SR 4, a significant but mitigable impact.

GEOLOGY AND SOILS

Alternative 1 – Reduced

Geological impacts occur largely independent from the physical traits of a given project because they most often occur due to surface and subsurface conditions of a given site and the vicinity and not from the physical characteristics of a given improvement or development. In the case of Alternative 1, the impacts identified may still occur and would affect the BART station and appurtenances similarly. Impacts would include ground rupture (earthquake) and soil suitability characteristics like stability, liquefaction potential, and shrink/swell potential—all events that would negatively impact the existing improvements on the property. However, Alternative 1 would result in fewer people and structures on the site; therefore, fewer impacts. For this reason Alternative 1 would have a reduced impact.

Alternative 2 – Similar

As with Alternative 1, identified geology and soils impacts would occur due to the conditions of the soil and underlayment of the Master Plan area and vicinity, not the actual characteristics of development. As such, Alternative 2 would have similar impacts to the proposed Master Plan. It is expected that, as with the proposed Master Plan, these impacts could be mitigated to a less than significant level.

Alternative 3 – Similar

As with Alternative 1, identified geology and soils impacts would occur due to the conditions of the soil and underlayment of the Master Plan area and vicinity, not the actual characteristics of development. As such, Alternative 3 would have similar impacts to the proposed Master Plan. It is expected that, as with the proposed Master Plan, these impacts could be mitigated to a less than significant level.

HYDROLOGY AND WATER QUALITY

Alternative 1 – Reduced

The site already contains an organized stormwater collection and pre-treatment/settling system, which collects, contains, and releases stormwater that falls on the impervious surfaces of the site into the existing storm drain at a rate that prevents any exceedance of system capacity. As such, this alternative would result in no functional impact on stormwater quality or collection. Similarly, as Alternative 1 would not include any construction activities, potential construction impacts on water quality identified for the proposed Master Plan would not occur, resulting in reduced overall hydrological impacts.

Alternative 2 – Similar

As Alternative 2 would include construction of new uses on the unimproved portions of the Master Plan area, it is anticipated that the same potential for construction-related impacts to surface water quality would occur. Likewise, the stormwater collection features of the WCHB site would be installed and connected to the existing detention basin with some increase in basin size to account for the additional runoff from the WCHB site. As the basin provides both pre-treatment/settling of stormwater and control of outflow to prevent exceedance of system capacity, it is anticipated that operational stormwater impacts would be similar to those indicated for the proposed Master Plan.

Alternative 3 – Similar

Alternative 3 would have an identical area of effect to the proposed Master Plan. The same amount of the site would undergo construction (100 percent) and the same impervious areas would be created. As such, both construction and operational water quality impacts would be largely identical. As with the proposed Master Plan, it is anticipated that these impacts would be mitigable to a less than significant level.

BIOLOGICAL AND NATURAL RESOURCES

Alternative 1 – Reduced

Alternative 1 would result in no functional change in the amount of the site left in its current undeveloped state. Trees on the BART property would remain, and no disturbance of the native and non-native grasses on both the WCHB site and the undeveloped BART property would occur. As such, Alternative 1 would be expected to have no impact to biological and natural resources.

Alternative 2 – Reduced

Biological impacts tend to be related more to changes in the existing environment than physical or operational effects of residential development. In the case of Alternative 2, the undeveloped WCHB site would be developed, leading to the same potential effects identified for the proposed Master Plan as they relate to the WCHB property. However, potential impacts to nesting birds and raptors would not occur as there are no trees on the WCHB site and trees on the BART property would remain. Similarly, the undeveloped BART property would remain in its current state. As such, the overall project would have a reduced biological and natural resources impact to that expected for the proposed Master Plan.

Alternative 3 – Similar

As described above, area of effect has much to do with the actual biological impact for typical residential/commercial development. As Alternative 3 would result in disturbance of the entire site, including removal of native and non-native grasses and existing trees, the impacts expected of the proposed Master Plan would still occur. As such, this alternative would result in largely similar impacts, all of which are anticipated to be mitigable.

AESTHETICS

Alternative 1 – Reduced

Under Alternative 1, no structures would be constructed and most of the site would remain in its current vacant state. This would preserve sight lines of the hills from SR 4 and sight lines of the Suisun Bay from properties to the south of the Master Plan area. Some impact in regard to visual character would occur, as the Master Plan area will soon be surrounded by urban development, leaving the WCHB site and the undeveloped BART parcel as undeveloped land in the middle of an established neighborhood. Additional visual character impacts would occur as Alternative 1 does not include any frontage improvements on West Leland Road.

Alternative 2 – Reduced

The General Plan identifies two points along SR 4 at which views are possible of the southern hillsides. One of these points is located close to the northwest corner of the Master Plan area. Under Alternative 2, this viewpoint would be blocked by development of the WCHB site. However, the second viewpoint, located east of that point along the BART property, would likely retain views of the southern hillsides, as no change to the BART property would occur under this alternative. In regard to visual character, development of the site would generally conform to that expected of the proposed Master Plan, save for the undeveloped BART parcel, which would result in the same visual character conflicts identified for Alternative 1 (though to a lesser degree due to the smaller area that would remain undeveloped.)

Alternative 3 – Similar

The primary change of Alternative 3 from the proposed Master Plan is building height. As the structures of the Master Plan would not exceed three stories, any impact to local visual character would be minimized, as development south and southeast of the project, as well as approved development to the west, would conform to this similar height. Homes to the south are two stories tall but multi-family housing to the southeast and planned multi-family to the west would be three stories in height. Regardless of the reduced height, however, views of the southern hillsides from SR 4 and of Suisun Bay from the south would remain intermittently blocked under this alternative.

PUBLIC SERVICES AND UTILITIES

Alternative 1 – Reduced

Alternative 1 would result in zero development; thus, no increase in the demand or need for public services or utilities would result. However, this reduction in impact over the proposed Master Plan is not substantial as the proposed Master Plan is not anticipated to have any significant impacts related to utilities and services.

Alternative 2 – Similar

While Alternative 2 includes some development that would require additional services and utilities, development intensity would be much lower (36 percent less residential and 100 percent less nonresidential), resulting in an incremental reduction in demand over the proposed Master Plan. As the Master Plan as proposed would not have any significant impacts to these utilities and services as it stands, this reduction would continue to be minor and would have no bearing on the CEQA determination of the project.

Alternative 3 – Similar

As with Alternative 2, Alternative 3 includes development that would require additional services and utilities. Development intensity would be somewhat lower than that expected from the proposed Master Plan (29 percent less residential and 43 percent less non-residential) resulting in an incremental reduction in demand over the proposed Master Plan. As the Master Plan as proposed would not have any significant impacts to these utilities and services as it stands, this reduction would be minor and would have no bearing on the CEQA determination of the project.

RECREATION

Alternative 1 – Reduced

As Alternative 1 would result in zero growth in the Master Plan area, no impact would occur to local parks and recreational resources.

Alternative 2 – Similar

Alternative 2 would include the addition of approximately 2,394 residents to the city (see **Table 6.0-1**). As such, demand for parks and recreational resources would increase incrementally in the city. The WCHB site is assumed to contain some private recreation and open space. However, the City only gives partial credit for private recreation and it is likely that WCHB would still be required to pay in-lieu fees to the City, which would go toward maintenance/upgrade of local parks and recreational resources. While the demand for parks would be incrementally less under this alternative, Alternative 2 does not include the construction of the 0.4-acre park included in the proposed Master Plan. As such, the demand for park and recreational resources to serve the alternative would likely be similar to those identified for the proposed Master Plan.

Alternative 3 – Similar

Alternative 3 would result in approximately 29 percent fewer residents added to the city than the proposed Master Plan. As such, demand for parks and recreational resources would decrease incrementally. Unlike Alternative 2, this alternative would include the 0.4-acre park, ensuring that overall demand would be less than the proposed Master Plan, resulting in an incrementally reduced potential for environmental effects related to provision of recreational resources. However, as the Master Plan would have a less than significant impacts in regards to recreation, the overall effect of Alternative 3 would be similar to the project as proposed.

GREENHOUSE GASES

Alternative 1 – Reduced

Under this alternative no additional greenhouse gas (GHG) emissions would occur as no development would occur. While current BART operations, including significant parking and bus loading/unloading, would continue, these activities are related to the use of alternative transportation, generally considered to reduce emissions over all. Conversely, Alternative 1 would not include any of the beneficial aspects of the proposed Master Plan, including increased ridership, Transit-Oriented Development, and other features which would help to reduce GHG emissions over time. However, the loss of any benefit from the Master Plan as proposed would not offset the reduction in GHGs overall by not developing the site.

Alternative 2 – Reduced

Alternative 2 would include some development, namely construction of the WCHB property. While this would increase cumulative emissions of GHGs, the amount of additional GHGs generated would be less than the proposed project as development would occur at a greatly reduced density and intensity. Furthermore, as the WCHB property would be located adjacent to the BART station, it is anticipated that residents of that property would, in part, utilize BART for commuting and travel west, resulting in some reduction in emissions over a similar development placed elsewhere. However, parking rates would remain at two per unit and the overall site plan would result in a gated, insular community as the development would not have the bicycle and pedestrian connections proposed on the eastern half of the Master Plan site.

Alternative 3 – Reduced

Alternative 3 would include substantial development similar to the proposed Master Plan including pedestrian and bicyclist amenities to support alternative modes of transportation. This alternative would also meet regional goals to locate higher density development in close proximity to existing transit stations. However, by limiting building height the overall development intensity is reduced and the number of dwelling units and square feet of non-residential development would be less. As such, GHG emissions would be moderately reduced when compared to the proposed Master Plan.

6.6 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

Table 6.0-2 (below) provides a summary of the potential impacts of the alternatives evaluated in this section, as compared with the potential impacts of the proposed project.

TABLE 6.0-2
COMPARISON OF ALTERNATIVES TO THE PROPOSED MASTER PLAN BY IMPACT

Impact	Proposed Project (Significance)	Alternative 1 No Project (Comparison)	Alternative 2 Existing BART Plus WCHB (Comparison)	Alternative 3 Reduced Development Potential (Comparison)
4.1 Land Use and Planning				
4.1.1 Consistency with Local Plans and Policies	LTS	S	S	S
4.1.2 Cumulative Land Use Compatibility	LCC	R	S	S
4.2 Population, Housing, and Employment				
4.2.1 Population Growth	LTS	R	S	S
4.2.2 Cumulative Population, Housing, and Employment Impacts	LCC	R	S	S
4.3 Hazards				
4.3.1 Emergency Response Plans	LTS	R	S	S
4.3.2 Wildland Fire Hazards	LTS	R	S	S
4.3.3 Environmental Hazards	LTS	R	S	S
4.3.4 Cumulative Hazards	LCC	S	S	S

Impact	Proposed Project (Significance)	Alternative 1 No Project (Comparison)	Alternative 2 Existing BART Plus WCHB (Comparison)	Alternative 3 Reduced Development Potential (Comparison)
4.4 Transportation and Traffic				
4.4.1 Increase in Project-Related Traffic	LTS	R	R	S
4.4.2 Construction-Related Traffic	LTS +M	R	S	S
4.4.3 Site Circulation and Access	LTS	R	R	S
4.4.4 Alternative Transportation	LTS +M	W	W	S
4.4.5 Cumulative Increase in Traffic	SU	R	R	R
4.5 Noise				
4.5.1 Exposure to Construction Noise	LTS +M	R	R	S
4.5.2 Increases in Traffic Noise	LTS	R	R	R
4.5.3 Exposure to Non-Transportation Noise	LTS +M	R	R	S
4.5.4 Land Use Compatibility	LTS +M	R	R	S
4.5.5 Exposure to Groundborne Vibration	SU	R	R	S
4.5.6 Contribution to Cumulative Noise Levels	LCC	R	S	S
4.6 Air Quality				
4.6.1 Construction Emissions	LTS +M	R	S	S
4.6.2 BAAQMD Plan Consistency	LTS	S	S	S
4.6.3 Operational Emissions	SU	R	S	S
4.6.4 Mobile Source Carbon Monoxide	LTS	R	S	S
4.6.5 Toxic Air Contaminants	LTS +M	R	S	S
4.6.6 Objectionable Odors	LTS	S	S	S
4.6.7 Cumulative Emissions	SU	R	S	S
4.7 Geology and Soils				
4.7.1 Ground Rupture	LTS	R	S	S
4.7.2 Liquefaction	LTS	R	S	S
4.7.3 Soil Stability	LTS +M	R	S	S
4.7.4 Expansive Soil	LTS +M	R	S	S
4.7.5 Cumulative Geology and Soils Impacts	LCC	R	S	S
4.8 Hydrology and Water Quality				
4.8.1 Standards and Discharge Requirements	LTS	R	S	S
4.8.2 Groundwater Supplies and Recharge	LTS	S	S	S
4.8.3 Alteration of Drainage	LTS	R	R	S
4.8.4 Cumulative Water Quality	LCC	R	S	S

Impact	Proposed Project (Significance)	Alternative 1 No Project (Comparison)	Alternative 2 Existing BART Plus WCHB (Comparison)	Alternative 3 Reduced Development Potential (Comparison)
4.9 Biological and Natural Resources				
4.9.1 Impacts to Listed Species	LTS	R	S	S
4.9.2 Impacts to Other Special-Status Species	LTS	R	S	S
4.9.3 Impacts to Sensitive Communities, including Riparian Habitat	LTS + M	S	S	S
4.9.4 Jurisdictional Wetlands	LTS + M	R	S	S
4.9.5 Species Movement	NI	S	S	S
4.9.6 HCP Consistency	LTS + M	R	S	S
4.9.7 Conflict with Local Policies/Ordinances	LTS + M	R	R	S
4.9.8 Cumulative Impacts	LCC	R	S	S
4.10 Aesthetics				
4.10.1 Impacts to Existing Visual Character	LTS	R	S	S
4.10.2 Views from State Route 4	LTS+M	R	R	S
4.10.3 Views from Surrounding Properties	LTS + M	R	S	S
4.10.4 Light and Glare	LTS	R	S	S
4.10.5 Cumulative Aesthetic Impacts	LCC	S	S	S
4.11 Public Services and Utilities				
4.11.1.1 Fire and Emergency Services	LTS	R	S	S
4.11.1.2 Cumulative Fire	LCC	R	S	S
4.11.2.1 Police Protection	LTS	R	S	S
4.11.2.2 Cumulative Police	LCC	R	S	S
4.11.3.1 Schools	LTS	R	R	R
4.11.3.2 Cumulative Schools	LCC	R	R	R
4.11.4.1 Environmental Impacts of Water Provision	LTS	R	R	R
4.11.4.2 Adequate Water Supply	LTS	R	R	R
4.11.4.3 Cumulative Water Supply	LCC	R	R	R
4.11.5.1 Wastewater	LTS	R	R	R
4.11.5.2 Cumulative Wastewater	LCC	R	R	R
4.11.6.1 Solid Waste	LTS	R	R	R
4.11.6.2 Cumulative Solid Waste	LCC	R	R	R
4.11.7.1 Electrical, Natural Gas, and Telecommunication Services	LTS	R	R	R
4.11.7.2 Consumption of Energy	LTS	R	R	R
4.11.7.3 Cumulative Electrical, Natural Gas, and Telecommunication Services	LCC	R	R	R

Impact	Proposed Project (Significance)	Alternative 1 No Project (Comparison)	Alternative 2 Existing BART Plus WCHB (Comparison)	Alternative 3 Reduced Development Potential (Comparison)
4.12 Recreation				
4.12.1 Increased Recreational Use	LTS	R	R	S
4.12.2 Cumulative Recreational Demands	LCC	R	R	S
4.13 Greenhouse Gases				
4.14.1 AB32 Compliance and GHG Emissions	LCC	R	R	R

Notes: Significance is identified by the following: NI = no impact, LTS = less than significant. LTS +M = less than significant with mitigation, SU = significant and unavoidable, LCC = Less than Cumulatively Considerable. Comparisons identified by the following: R = reduced impact over the proposed Master Plan. S = similar impact. W = worsened impact.

Based upon the evaluation described in this section, Alternative 1, the No Project Alternative, is considered to be the environmentally superior alternative. Alternative 1 was determined to have the fewest negative impacts on the physical environment. Alternative 1 would have less adverse environmental impacts than the proposed project. However, it should be noted that Alternative 1 would not meet any of the objectives of the proposed project and would not fulfill the General Plan's vision consistent with the Mixed Use land use designation.

Under CEQA Guidelines Section 15126.6(e)(2), if the environmentally superior alternative is the No Project Alternative, then another environmentally superior alternative must be identified. According to the analysis above, especially the accounting of **Table 6.0-2**, Alternative 2 would have the least environmental impact when compared with the proposed Master Plan. As much of the Master Plan development would not occur, namely any development within the BART property, many of the impacts that were identified for the proposed Master Plan would not occur. However, this alternative would not substantially meet the goals set forth for the plan to support creation of a transit oriented development that supports bicyclists and pedestrians around the existing BART Station. In addition, it does not meet regional goals to reduce greenhouse gas emissions and vehicle miles traveled by locating substantial growth on existing infill sites located in close proximity to transit. Rather, development of the WCHB site as proposed would result in an insular, vehicle oriented, suburban development with typical roadway and parking requirements.

Alternative 3 would result in increased growth in accordance with regional goals and the specific project goals; however, it could pose a missed opportunity to develop higher density development provided that the market would support such development. Limiting development to three stories in height could conceivably limit development around an existing transit station that is linked to major regional job and commercial centers thereby supporting the use of alternative modes of transportation besides the single occupancy vehicle.

7.0 Long-Term Implications

This section discusses additional topics statutorily required by the California Environmental Quality Act (CEQA) concerning the long-term implications of the proposed Master Plan. The topics discussed include growth-inducing impacts, significant irreversible environmental changes, including irretrievable commitment of resources, and significant and unavoidable environmental impacts.

7.1 GROWTH-INDUCING IMPACTS

INTRODUCTION

CEQA Guidelines Section 15126.2(d) requires that an environmental impact report (EIR) evaluate the growth-inducing impacts of a proposed action. A growth-inducing impact is defined by the CEQA Guidelines as:

> The way in which a proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth . . . It is not assumed that growth in an area is necessarily beneficial, detrimental, or of little significance to the environment.

A project can have direct and/or indirect growth inducement potential. For example, direct growth inducement would result if a project involved construction of new housing. A project would have indirect growth inducement potential if it established substantial new permanent employment opportunities or if it would involve a construction effort with substantial short-term employment opportunities that would indirectly stimulate the need for additional housing and services to support the new employment demand (*Napa Citizens for Honest Government v. Napa County Board of Supervisors*). Similarly, a project would indirectly induce growth if it would remove an obstacle to additional growth and development, such as removing a constraint on a required public service. A project providing an increased water supply in an area where water service historically limited growth could be considered growth-inducing.

The CEQA Guidelines further explain that the environmental effects of induced growth are considered indirect impacts of the proposed action. These indirect impacts or secondary effects of growth may result in significant, adverse environmental impacts. Potential secondary effects of growth include increased demand on other community and public services and infrastructure, increased traffic and noise, and adverse environmental impacts such as degradation of air and water quality, degradation or loss of plant and animal habitat, and conversion of agricultural and open space land to developed uses.

Growth inducement may constitute an adverse impact if the growth is not consistent with, or accommodated by, the land use plans and growth management plans and policies for the area affected. Local land use plans provide for land use development patterns and growth policies that allow for the orderly expansion of urban development supported by adequate urban public services, such as water supply, roadway infrastructure, sewer service, and solid waste service.

COMPONENTS OF GROWTH

The timing, magnitude, and location of land development and population growth in a community are based on various interrelated land use and economic variables. Key variables include regional economic trends, market demand for residential and nonresidential uses, land availability and cost, the availability and quality of transportation facilities and public services, proximity to employment centers, the supply and cost of housing, and regulatory policies or conditions. Since the general plan of a community defines the location, type, and intensity of growth, it is the primary means of regulating development and growth in California.

GROWTH EFFECTS OF THE PROJECT

The proposed Master Plan would guide future development on the project site. While the Master Plan does not, in itself, mandate or propose any specific development, future development will be required to meet the design, land use, and other requirements of the Master Plan. This includes all aspects of future land use including structure design, allowed uses, parking, street design, transit accommodation, parks, landscaping, and other aspects of physical development. Furthermore, by utilizing the allowed land uses and densities delineated in the Master Plan, an assumed amount of development that would likely occur on the project site has been formulated (see Section 4.0, Assumptions).

According to the buildout assumptions, the Master Plan area is expected to be developed with 1,168 dwelling units and 146,362 square feet of nonresidential development employing approximately 1,300 people. This development represents direct growth in the Master Plan area and in the city as a whole. The direct growth inducement of the project is discussed in Section 4.2, Population, Housing, and Employment. The associated secondary effects of this growth are discussed in aggregate in the various technical sections of this DEIR (Sections 4.1 through 4.13).

Population Growth

As described in Section 4.2, Population, Housing and Employment, the direct growth anticipated from the Master Plan would add approximately 1,168 dwellings to the City of Pittsburg. As housing constructed in the Master Plan Area would all be multi-family housing, future population growth can be estimated by multiplying the number of units by the average persons per household, a statistic available from the U.S. Census Bureau. As described in Section 4.2, this average is expected to change little through the life of the Master Plan and is expected to remain approximately 3.2 persons per household for some time. As such, the Master Plan is expected to result in direct population growth of 3,728 persons.

Growth Effects Associated with Infrastructure Improvements

The potential to indirectly induce growth is assumed to exist if a project would remove an obstacle to additional growth and development, such as removing a constraint on a required public service or if construction of additional infrastructure or resources would result in excess capacity that would allow additional growth to occur. In the case of the proposed Master Plan, all infrastructure and utilities are located immediately adjacent to or on the Master Plan site. Land uses in the Master Plan area would utilize existing capacity for all services and utilities and would connect to existing networks. As no excess capacity would be created by the Master Plan, indirect growth effects are not anticipated.

ENVIRONMENTAL EFFECTS OF GROWTH

As described previously, the intent of the proposed Master Plan is to accommodate anticipated growth through compact, walkable, infill, transit-oriented, and mixed-use development. The City's General Plan provides for this anticipated growth, as does planning by service and utility providers. Thus, growth accommodated under the proposed Master Plan would be confined to the immediate Master Plan area and would avoid growth effects on parcels adjacent to the project. The environmental effects of buildout of the Master Plan are addressed in Sections 4.1 through 4.13 of this DEIR, and the project's cumulative impacts are addressed in Section 5.0.

7.2 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL EFFECTS

CEQA Guidelines Sections 21100(b)(2) and 21100.1(a) require that EIRs prepared for the adoption of a plan, policy, or ordinance of a public agency must include a discussion of significant irreversible environmental changes that would result from project implementation. In addition, CEQA Guidelines Section 15126.2(c) describes irreversible environmental changes in the following manner:

> Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.

Implementation of the proposed Master Plan would result in the conversion of undeveloped and/or underutilized properties zoned for mixed use to residential, commercial, office, public, and recreational uses. Subsequent development under the Master Plan would constitute a long-term commitment to these uses. It is unlikely that circumstances would arise that would justify the return of those sites to their original condition.

Development of the Master Plan area would irretrievably commit building materials and energy to the construction and maintenance of buildings and infrastructure. Renewable, nonrenewable, and limited resources that would likely be consumed as part of the development of the proposed Master Plan would include, but are not limited to, oil, gasoline, lumber, sand and gravel, asphalt, water, steel, and similar materials. In addition, development of the project would result in the increased demand on public services and utilities (see Section 4.11, Public Services and Utilities).

7.3 SIGNIFICANT AND UNAVOIDABLE ENVIRONMENTAL EFFECTS

CEQA Guidelines Section 15126.2(b) requires an EIR to discuss unavoidable significant environmental effects, including those that can be mitigated but not reduced to a level of insignificance. In addition, Section 15093(a) of the CEQA Guidelines allows the decision-making agency to determine whether the benefits of a proposed project outweigh the unavoidable adverse environmental impacts of implementing the project. The City can approve a project with unavoidable adverse impacts if it prepares a Statement of Overriding Considerations setting forth the specific reasons for making such a judgment.

The following impacts of the proposed Master Plan, which have been recognized as significant and unavoidable in either the project or cumulative context, are specifically identified in Sections 4.1 through 4.13 and Section 5.0 of this DEIR. The reader is referred to the various environmental issue areas of these sections for further details and analysis of these significant and unavoidable impacts.

TRANSPORTATION AND TRAFFIC

Impact 4.4.5 The proposed Master Plan may cause an increase in traffic that is substantial in relation to the cumulative traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or reduction in level of service) during the cumulative plus project condition. This impact is **cumulatively considerable**.

Roadway Operations

The following cumulative impacts were identified by the cumulative traffic analysis:

a) **San Marco Boulevard/SR 4 Eastbound Ramps**: This intersection is projected to operate deficiently in the Cumulative No Project condition in the PM peak hour. The addition of project traffic would increase the volume-to-capacity ratio.

b) **San Marco Boulevard/West Leland Road**: This intersection is projected to operate deficiently in the Cumulative No Project condition in both AM and PM peak hours. The addition of project traffic would increase the volume-to-capacity ratio during both peak hours.

c) **West Leland Road/Oak Hills Drive/D Street**: This intersection is projected to operate at an overall acceptable level in the Cumulative No Project condition in both AM and PM peak hours using the HCM analysis method, although side-street operations would experience excessive delay. With development of the proposed project, a fourth approach, D Street, would be added to the intersection to provide access to and from the Master Plan Area, and the resulting intersection would be signalized. The signalized intersection would operate deficiently in the Cumulative Plus Project conditions in the PM peak hour.

d) **Bailey Road/Willow Pass Road**: This intersection is projected to operate deficiently in the Cumulative No Project condition in the AM peak hour. The addition of project traffic would increase the volume-to-capacity ratio.

e) **Bailey Road/West Leland Road**: This intersection is projected to operate deficiently in the Cumulative No Project condition in both AM and PM peak hours. The addition of project traffic would increase the volume-to-capacity ratio during both peak hours.

f) **Bailey Road/Concord Boulevard**: This intersection is projected to operate deficiently in the Cumulative No Project condition in the AM peak hour. The addition of project traffic would increase the volume-to-capacity ratio during the AM peak hour and result in deficient operations during the PM peak hour.

All of the above cumulative impacts are expected to be significant. While they are cumulative in nature, and would thus be created by the proposed Master Plan only in combination with other existing, approved, and anticipated development in the cumulative setting, the proposed Master Plan's contribution to these impacts would be **cumulatively considerable**.

Freeway Operations

The Delay Index was evaluated for the Cumulative Plus Project condition and compared to Cumulative No Project conditions, as shown in **Table 4.4-16** below.

The addition of project traffic is not expected to degrade the Delay Index on SR 4 in the study area. Therefore, the cumulative impact to the freeway system is considered less than cumulatively considerable.

TABLE 4.4-16
CUMULATIVE CONDITIONS – FREEWAY MAINLINE SPEEDS AND DELAY INDEX

Segment	Direction[1]	Cumulative No Project		Cumulative Plus Project	
		AM	PM	AM	PM
SR 4 (Between SR 242 and Bailey Road)	WB	1.4	1.9	1.5	1.9
	EB	1.3	1.3	1.3	1.3
SR 4 (Between Bailey Road and Loveridge Road)	WB	1.2	1.1	1.2	1.1
	EB	1.4	1.1	1.4	1.1

Source: CCTA, Final 2007 Traffic Service Objective Monitoring Report and Fehr & Peers, 2011
Notes: 1. WB = westbound; EB = eastbound

Mitigation Measures

The proposed Master Plan and the accompanying Access/Accessibility Plan include improvements, policies, and strategies that would reduce the overall project automobile trip generation and reduce the magnitude of the potentially significant project-related traffic impacts. The project trip generation, as described above, accounts for some of these project characteristics, including proximity to transit, mix of uses within the Master Plan area, and pedestrian-oriented design. The following improvements, policies, or strategies, as recommended in the Master Plan and/or the Access/Accessibility Plan, would further reduce the project automobile trip generation:

- Aggressive parking polices, such as limiting parking supply, unbundling residential parking from dwelling units, shared parking, and providing on-street metered spaces, to reduce the project dependence on automobile
- A robust Transportation Demand Management (TDM) plan that includes car sharing, ride matching, discounted transit passes for area residents and employees
- Improved non-motorized connections to adjacent uses and trails

It is not possible to accurately predict the effectiveness of the above-listed strategies or to quantify their effects on reducing project automobile trip generation. However, these measures would reduce the magnitude of the identified project impacts on traffic operations at study intersections. To present a conservative analysis, the DEIR assumes that they would not be sufficient to reduce the significant impacts to a less than significant level. Therefore, the impact would remain **significant**.

In addition, the following mitigation measures present improvements at the identified impact locations to reduce the proposed Master Plan's contribution to cumulative impacts:

MM 4.4.5a The City of Pittsburg shall cooperate with Caltrans to develop a program to fund and implement improvements that could include:

- construction of additional turn lanes so as to improve operations at the San Marco Boulevard/SR 4 Eastbound Ramps intersection;
- the conversion of the center eastbound left-turn lane to a left-right shared lane at the intersection of Willow Pass Road and Eastbound SR 4;

Future development projects in the Master Plan Area shall contribute their fair share to these improvements, which include converting the second eastbound left-turn lane to a shared left/right turn lane.

Timing/Implementation:	*Payment of future development projects' fair share shall be made prior to approval of any building permits.*
Enforcement/Monitoring:	*Caltrans and City of Pittsburg Development Services Department*

Implementation of mitigation measure **MM 4.4.5a** would provide additional turning movement capacity and mitigate the project impact. However since these intersections are under the jurisdiction of Caltrans, neither the City nor a future applicant for development has control over approval or timing of such improvements. Therefore, the impact is considered **significant and unavoidable** because these are outside the jurisdiction of the City of Pittsburg.

MM 4.4.5b Future development projects in the Master Plan Area shall contribute their fair share to implement improvements that would improve intersection operations at the San Marco Boulevard/West Leland Road intersection, including:

- Westbound: Modify north leg of intersection to provide a third receiving lane to permit free westbound right-turn movement.
- Northbound: Modify to provide one left-turn lane, two through lanes, and a right-turn only lane.

These improvements may require traffic signal modifications.

Timing/Implementation:	*Payment of future development projects' fair share shall be made prior to issuance of any building permits.*
Enforcement/Monitoring:	*City of Pittsburg Development Services Department*

Implementation of mitigation measure **MM 4.4.5b** would provide additional turning movement capacity and result in acceptable intersection operations. This would ensure that the project's contribution to the cumulative impact on this intersection would be **less than cumulatively considerable**.

Were mitigation measure **MM 4.4.5b** constructed, it would require intersection widening, potentially increasing pedestrian crossing time at the intersection, resulting in a secondary pedestrian impact.

MM 4.4.5c As part of development of the BART parcels, the City of Pittsburg shall ensure that construction of the northbound approach of the West Leland Road/Oak Hills Drive/D Street intersection provides a left-turn and a through-right shared lane and modification of the traffic signal to provide protected north-south left-turn movements.

Timing/Implementation: *Payment of future development projects' fair share shall be made prior to issuance of building permits on BART -owned properties.*

Enforcement/Monitoring: *City of Pittsburg Development Services Department in consultation with BART.*

Implementation of mitigation measure **MM4.4.5c** would provide additional turning movement capacity. However, the intersection would continue to operate deficiently. Therefore, this impact will remain **significant and unavoidable** even with implementation of mitigation.

Were mitigation measure **MM 4.4.5c** implemented, all disturbance would occur within the existing intersection right-of-way and would not increase the pedestrian crossing time. Therefore the secondary impact of implementing this mitigation to other modes of travel would be less than significant.

MM 4.4.5d The City of Pittsburg shall cooperate with Contra Costa County to develop a program to fund and implement improvements that would result in acceptable intersection operations at the Bailey Road/Willow Pass Road intersection. Future development projects in the Master Plan Area shall contribute their fair share to these improvements which include conversion of the center through lane to a shared left-through lane.

Timing/Implementation: *Payment of future development projects' fair share shall be made prior to issuance of building permits or in accordance with any future agreements between the County and the City .*

Enforcement/Monitoring: *Contra Costa County Public Works Department and City of Pittsburg Development Services Department*

Implementation of mitigation measure **MM 4.4.5d** would provide additional turning movement capacity and result in acceptable intersection operations. Since this intersection is under the jurisdiction of Contra Costa County, neither the City nor a future applicant for development has control over approval or timing of such an improvement. Therefore, the impact is considered **significant and unavoidable** because it is outside the jurisdiction of the City of Pittsburg.

Mitigation measures **MM 4.4.5d** could be implemented within the existing intersection right-of-way and would not increase the pedestrian crossing time. Therefore the secondary impact of implementing this mitigation to other modes of travel would be less than significant.

MM 4.4.5e Future development projects in the Master Plan Area shall contribute their fair share to implement the following improvements that would improve operations at Bailey Road/West Leland Road intersection:

- Restripe the northbound approach to provide dual left-turn lanes.
- Widen the eastbound approach to add a second left-turn lanes and one right-turn lane

These improvements are consistent with the City of Pittsburg's Five Year Capital Improvement Program 2011-2012 through 2016-2017). These improvements may require traffic signal modifications.

Timing/Implementation: *Payment of future development projects' fair share shall be made prior to issuance of any building permits.*

Enforcement/Monitoring: *City of Pittsburg Development Services Department*

The provision of additional capacity through the implementation of mitigation measure **MM 4.4.5e** would improve the intersection operation as compared to the Cumulative No Project scenario. This would ensure that the project's contribution to the cumulative impact on this intersection would be **less than cumulatively considerable**.

MM 4.4.5e could not be implemented within the existing intersection right-of-way. Additional right-of-way would be needed to widen the eastbound approach at the intersection. In addition, widening the eastbound approach would increase the pedestrian crossing time, resulting in secondary impacts on pedestrians.

MM 4.4.5f The City of Pittsburg shall cooperate with City of Concord to amend the Bailey Road Traffic Mitigation Measure Inter-Agency Funding Agreement to include the proposed developments included in the Pittsburg/Bay Point BART Master Plan. Future development projects in the Master Plan Area shall contribute their fair share to implement the identified improvements.

Timing/Implementation: *Payment of future development projects' fair share shall be made prior to issuance of building permits or in accordance with any future agreements between the the City of Concord and Pittsburg.*

Enforcement/Monitoring: *City of Pittsburg Development Services Department and City of Concord*

Considering existing developments at all four corners of this intersection, potential improvements would require significant right-of-way acquisition. Potential improvements that would widen one or more intersection approaches would also degrade the pedestrian environment. In addition, since this intersection is under the jurisdiction of City of Concord, neither the City of Pittsburg nor a future applicant for development has control over approval or timing of potential improvements. Therefore, the impact is considered **significant and unavoidable** because it is outside the jurisdiction of the City of Pittsburg.

Due to the range of cumulatively considerable impacts for which mitigation is infeasible, the proposed Master Plan's contribution to cumulative impacts would remain **cumulatively considerable** and **significant and unavoidable**.

NOISE

Impact 4.5.5 Groundborne vibration levels associated with pile-driving activities, if required, could exceed applicable groundborne vibration criterion at nearby land uses. This impact would be **potentially significant**.

Ground vibration spreads through the ground and diminishes in strength with distance. The effects of ground vibration can vary from no perceptible effects at the lowest levels, low rumbling sounds and detectable vibrations at moderate levels, and slight damage to nearby structures at the highest levels. At the highest levels of vibration, damage to structures is primarily architectural (e.g., loosening and cracking of plaster or stucco coatings) and rarely results in structural damage. For most structures, a peak particle velocity (ppv) threshold of 0.5 inches per second (in/sec) is sufficient to avoid structure damage, with the exception of fragile historic structures or ruins. For the protection of fragile, historic, and residential structures, Caltrans recommends a more conservative threshold of 0.2 inches per second ppv. This same threshold would represent the level at which vibrations would be potentially annoying to people in buildings (FTA 2006; Caltrans 2002).

Long-term operational activities associated with the proposed project would not involve the use of any equipment or processes that would result in potentially significant levels of ground vibration. Increases in groundborne vibration levels attributable to the proposed project would be primarily associated with short-term construction-related activities. Groundborne vibration levels associated with construction equipment are summarized in **Table 4.5-10**. Construction activities associated with the proposed improvements would likely require the use of various tractors, trucks, and jackhammers. Pile drivers may also be required during construction of the proposed parking garages.

TABLE 4.5-10
REPRESENTATIVE CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Equipment	Peak Particle Velocity at 25 Feet (in/sec ppv)
Impact Pile Driver (Upper Range)	1.518
Impact Pile Driver (Typical)	0.644
Sonic Pile Driver (Upper Range)	0.734
Sonic Pile Driver (Typical)	0.17
Vibratory Roller	0.21
Large Tractors	0.089
Caisson Drilling	0.089
Loaded Trucks	0.076
Jackhammer	0.035
Small Tractors	0.003

Source: Caltrans 2004; FTA 2006

Based on the vibration levels presented in **Table 4.5-10**, ground vibration generated by most off-road construction equipment, such as tractors, trucks, and tractors, would be less than 0.09 inches per second ppv at 25 feet and would not pose a significant risk to nearby structures or occupants. However, in the event that pile driving would be required for construction of the proposed parking garages, detectable increases in groundborne vibration levels at off-site locations could potentially occur. Groundborne vibration levels would depend on the specific equipment being used, the distance from the source to the receptor, and soil conditions. To be conservative, and given that the specific type of equipment to be used during construction has not yet been determined, vibration levels associated with potential pile-driving activities were calculated based on the upper-range levels associated with impact pile drivers (i.e., 1.518 in/sec ppv at 25 feet). Based on this upper range of vibration levels and conservative assumptions for ground attenuation rates, structures located within 75 feet of pile-driving activities could potentially exceed the commonly applied threshold of 0.5 in/sec ppv for structural damage. In addition, land uses located within approximately 160 feet of impact pile-driving activities could also exceed commonly applied thresholds for human annoyance (i.e., 0.2 in/sec ppv). Potential groundborne vibration levels and impacts associated with the construction of the proposed parking garages are discussed in greater detail below.

Parking Garage 1

The proposed Parking Garage 1 would be located near the northeastern boundary of the Master Plan area and would be constructed during the second phase of development. The nearest existing structures include commercial retail uses located approximately 65 feet east of the site, within the Oak Hills Shopping Center, and the BART transit station, which is located in the center median of SR 4, approximately 270 feet north of the proposed parking garage. In addition, Phase 1 of the proposed Master Plan would include the development of mixed retail, flex, and residential land uses. These land uses would be located approximately 150 feet west of the proposed Parking Garage 1.

Assuming a maximum pile-driving vibration level of 1.518 in/sec ppv and the distances noted above, predicted groundborne vibration levels at the nearest existing commercial retail structures within the Oak Hills Shopping Center would be approximately 0.53 in/sec ppv, or less. Predicted groundborne vibration levels at the BART transit station would be approximately 0.11 in/sec ppv. Groundborne vibration levels at the proposed Phase 1 land uses could reach levels of approximately 0.21 in/sec ppv. Predicted groundborne vibration levels at the nearest commercial retail structures could potentially exceed the commonly applied threshold of 0.5 in/sec ppv for structural damage. As noted above, structural damage at these levels would be primarily associated with some loosening and cracking of plaster or stucco coatings. In addition, predicted groundborne vibration levels at these same commercial retail uses, as well as the proposed Phase 1 development, could also exceed commonly applied thresholds for human annoyance (i.e., 0.2 in/sec ppv). Construction of the proposed Parking Garage 1 would therefore be considered to have a **significant** impact.

Parking Garage 2

The proposed Parking Garage 2 would be located within the southeast quadrant of the Main Street and C Street intersection, approximately 75 feet north of West Leland Road. Parking Garage 2 would be constructed during the third phase of development. The nearest existing structures include residential dwellings located approximately 175 feet to the south, across West Leland Road, and commercial-retail structures located approximately 275 feet to the east, within the Oak Hills Shopping Center. As noted above, Phase 1 of the proposed Master Plan would include the development of a mix of retail, flex, and residential housing, which would be located approximately 75 feet north of the proposed Parking Garage 2.

Assuming a maximum pile-driving vibration level of 1.518 in/sec ppv and the distances noted above, predicted groundborne vibration levels at the nearest existing residential land uses located south of West Leland Road would be approximately 0.18 in/sec ppv, or less. Predicted groundborne vibration levels at the nearest commercial structures within the Oak Hills Shopping Center would be approximately 0.11 in/sec ppv. Groundborne vibration levels at the proposed Phase 1 land uses could reach levels of approximately 0.45 in/sec ppv. Predicted groundborne vibration levels at nearby existing structures would not be predicted to exceed commonly applied thresholds. However, predicted groundborne vibration levels at structures located within Phase 1 of the proposed Master Plan development could potentially exceed the commonly applied threshold for human annoyance (i.e., 0.2 in/sec ppv). Construction of the proposed Parking Garage 2 would therefore be considered to have a **significant** impact.

Mitigation Measures

MM 4.5.5 Impact pile-driving equipment used within 160 feet of nearby structures shall be substituted with equipment or procedures that would generate lower levels of groundborne vibration, to the extent that geological conditions would permit their use. For instance, in comparison to impact pile drivers, drilled piles or the use of a sonic or vibratory pile drivers are preferred alternatives. In the event that the use of impact pile drivers is required due to geological conditions, groundborne vibration monitoring shall be conducted for impact pile driving that occurs within 160 feet of existing structures. Pile-driving activities shall be suspended if measured groundborne vibration levels approach within 0.1 in/sec ppv of commonly applied threshold of 0.5 in/sec ppv for structural damage. In such instances, additional attenuation measures or changes in pile-driving techniques shall be implemented, prior to recommencing pile-driving activities, to reduce groundborne vibration levels. For impact pile-driving activities that occur within approximately 75 feet of existing structures, a building conditions survey shall be conducted for existing structures in order to document existing structural conditions. Any structural damage resulting from nearby impact pile-driving activities shall be repaired in a timely manner by the developer. The building conditions survey shall be conducted by a licensed professional engineer and shall include pre- and post-construction surveys. The surveys shall, at a minimum, include the following:

a. Photographic and videotape documentation of the interior and exterior condition of the building(s);

b. The extent and location of existing signs of building distress such as cracks, spalling, signs of settlement, flooding, leaking, etc.

Timing/Implementation: As a Condition of Approval for any building or construction permit for the parking garages.

Enforcement/Monitoring: City of Pittsburg Development Services Department

Mitigation measure **MM 4.5.1** would ensure that construction-related activities, including the use of pile drivers, would be limited to the less noise-sensitive daytime hours. In the event that pile driving is required for the construction of the proposed parking garages, the use of impact pile drivers within 160 feet of nearby structures would be substituted with equipment or procedures that would generate lower levels of groundborne vibration, to the extent that geologic conditions would permit their use. With the use of alternative pile-driving techniques, such as sonic or drilled piles, predicted groundborne vibration levels at the nearest commercial structures located within the Oak Hills Shopping Center would be reduced to approximately 0.4 in/sec ppv, or less. Implementation of the proposed mitigation measures would reduce this impact. However, depending on the construction techniques used, construction of proposed Parking Garage 1 could still result in activity interference and annoyance to occupants of the nearby commercial uses. For this reason, this impact would be considered **significant and unavoidable**. However, it is important to note that this conclusion may change in the future, as specific development proposals are received by the City that include more detailed construction information and equipment requirements.

AIR QUALITY

Impact 4.6.3 Subsequent land use activities associated with implementation of the proposed Master Plan could result in long-term, operational emissions that could violate or substantially contribute to violations of federal and state ambient air quality standards. This impact is considered to be **potentially significant**.

Implementation of the proposed Master Plan would result in the development and operation of new land uses, which would generate increased air emissions. For comparison purposes, projected increases in emissions associated with projected future development, with and without implementation of the proposed project, are summarized in **Table 4.6-8**. As depicted, the proposed Master Plan would result in net increases of approximately 41 tons per year of ROG, 28 tons per year of NO_X, 37 tons per year of PM_{10}, and 10 tons per year of $PM_{2.5}$. According to these estimates, mobile sources are the largest contributor of air pollutant emissions. Future development attributable to the proposed Master Plan would be anticipated to result in increased emissions from both area and mobile sources.

TABLE 4.6-8
PROPOSED MASTER PLAN LONG-TERM OPERATIONAL EMISSIONS

Scenario	Annual Emissions (tons/year)			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
Master Plan Buildout				
Area Sources	19.00	2.29	3.91	3.76
Mobile Sources	22.01	25.85	33.62	6.46
Total	**41.01**	**28.14**	**37.53**	**10.22**

Notes: Emissions were quantified using the URBEMIS 2007 computer program. Area source emissions include emission associated with natural gas use, landscape maintenance, architectural coatings, and consumer products. Total emissions are based on the following assumptions:
Master Plan Buildout: Assumes 1,168 dwelling units, 45.3 KSF retail, 50.53 KSF regional commercial,34.36 KSF general office buildings, and 16.17 KSF office park. Assumes 107,000 vehicle miles traveled/day.

Based on the modeling conducted, estimated operational emissions of ROG, NO_x, PM_{10}, and $PM_{2.5}$ associated with buildout of the proposed Master Plan would exceed the BAAQMD-recommended significance thresholds of 10 tons per year of ROG, NO_x, and $PM_{2.5}$ and 15 tons per year of PM_{10}. As operation emissions at buildout of the proposed Master Plan would result in exceedence of BAAQMD significance thresholds, this impact would be considered **significant and unavoidable**.

Mitigation Measures

There is no feasible mitigation available to reduce this impact to a less than significant level beyond redesigning the project to substantially limit the amount of residential units and/or commercial uses. However, one of the objectives of the proposed Master Plan is to promote sustainable development characterized by a mix of uses and a circulation system that prioritizes pedestrians, bicyclists, and transit riders over single-occupancy vehicles. Limiting either the residential or commercial aspects of the Master Plan could actually increase vehicle miles traveled and thus criteria air pollutant emissions in the city over the long term, as there would be less linkage between city residences and BART transit.

While the total trips would increase over current conditions due to the project, the overall local and regional goals of supporting development of high density, mixed use infill development within one-half mile of existing transit in combination with transportation and parking demand management policies within the proposed Master Plan (i.e. parking maximums, and providing a strong pedestrian, transit, bicycle access environment as well as supporting alternative access programs as set forth in Chapter 6 of the Master Plan, and supporting documents). The Master Plan would serve to support a truly multi-modal environment thereby ultimately reducing vehicle miles traveled both within and from the project area.

In addition to the overall nature of the project, the proposed Master Plan includes several green design requirements, as codified in Section 5 of the Master Plan. Included in these measures is a requirement to exceed California minimum energy efficiency standards (Title 24, Part 6) by 15 percent[1]. Future development proposals within the Master Plan Area would be required to demonstrate compliance with these green building standards.

Further air quality mitigation is provided by the City's requirements that street lights and signals be lit by LEDs, which use much less electricity than standard incandescent lightbulbs and reduce emissions as a result of power generation. Future development projects would be required to pay their fair share into the City's Lighting & Landscaping District, which is currently replacing street lighting with LED lighting in the City (including in the immediately vicinity of the Master Plan Area). Future development projects would likewise pay their fair share into the Pittsburg Local Transportation Mitigation Fee, which funds installation of LED signaling. Furthermore, current City Engineering Standards require the installation of signaling approved by the Engineering Division – which requires that new signals utilize LED technology.

While the following mitigation measure would not result in a less than significant determination for the proposed Master Plan, it would serve to further reduce the intensity of the significant air quality impact.

MM 4.6.3 To the greatest extent feasible, future development proposals in the Master Plan Area shall comply with the City's adopted Green Building Design Guidelines, or any applicable City green/efficient building regulations which are in effect at the time of development.

Timing/Implementation: *Prior to issuance of Building Permits.*

Enforcement/Monitoring: *City of Pittsburg Development Services Division.*

[1] Energy efficiency beyond that required by Title 24 is recommended by BAAQMD as a method of reducing energy use of a project and thus criteria emissions created by power generation. Specific efficiencies beyond Title 24 vary throughout the state. 15 percent is a general average of similar requirements placed on other development in the state.

As previously mentioned, there is no feasible mitigation available to reduce this impact to a less than significant level beyond redesigning the project to substantially limit the amount of residential units and/or commercial uses. However, while mitigation measure **MM 4.6.3** would not result in a less than significant determination for the proposed project, it would assist to reduce the intensity of resultant significant air quality impacts. Regardless, this impact would remain **significant and unavoidable**.

Impact 4.6.7 Implementation of the proposed Master Plan, in combination with cumulative development in the SFBAAB, would result in a cumulatively considerable net increase of ozone and coarse and fine particulate matter. This is considered a **cumulatively considerable** impact.

As previously identified under Impact 4.6.3, the proposed Master Plan would result in increased VMT that would exceed the BAAQMD-recommended significance thresholds of 10 tons per year of ROG, NO_x, and $PM_{2.5}$ and 15 tons per year of PM_{10}.

The proposed Master Plan would be strategically located adjacent to regional mass transit (BART station) and has been designed to reduce the environmental impact of land use development by developing on an infill site, and increasing the viability of walking with clustered, mixed-use development design concepts. Such concepts would reduce emissions from area and mobile sources. However, the projected increase of criteria pollutant emissions would still exceed the pollutant emission thresholds. As a result, future development associated with the proposed project may interfere with future attainment and/or maintenance of ambient air quality standards.

The design of the proposed Master Plan along with implementation of mitigation measure **MM 4.6.3** would assist in reducing the proposed project's contribution to cumulative air quality impacts. However, this alone may not be sufficient to reduce this impact to a less than significant level. Because the proposed Master Plan would contribute to a cumulative increase in criteria pollutants, the Master Plan's contribution to the cumulative impact is considered **cumulatively considerable** and thus a **significant and unavoidable** impact.

Mitigation Measures

There are no feasible mitigation measures that can completely offset air pollutant emissions from subsequent development under the proposed Master Plan, save for prohibiting the project entirely. As that would result in every single project goal becoming unobtainable, it is not a feasible option. However, implementation of mitigation measure **MM 4.6.3** above would reduce the intensity of the impact – though it would remain **significant and unavoidable**. As noted above, although the project's impacts would be cumulatively considerable, the project would fulfill overarching local and regional goals of supporting development of high density, mixed use infill development within one-half mile of existing transit in combination with transportation and parking demand management policies within the proposed Master Plan (i.e. parking maximums, and providing a strong pedestrian, transit, bicycle access environment as well as supporting alternative access programs as set forth in Chapter 6 of the Master Plan, and supporting documents). The Master Plan would serve to support a truly multi-modal environment thereby ultimately reducing vehicle miles traveled both within and from the project area.

8.0 Report Preparers

CITY OF PITTSBURG

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Senior Project Engineer	Shawn O'Keefe

APPENDICES

APPENDIX A: TERMS AND ABBREVIATIONS

Identified below are common terms used throughout this document. A complete list of abbreviations is also provided.

CEQA TERMINOLOGY

This Draft EIR uses the following terminology to describe environmental effects of the proposed project:

Cumulatively Considerable: A cumulative significant impact would result when the project would contribute considerably to a significant physical impact on the environment expected under cumulative conditions.

Less Than Cumulatively Considerable: A less than cumulatively considerable impact would result when the project would not contribute considerably to a significant physical impact on the environment expected under cumulative conditions.

Less Than Significant Impact: A less than significant impact would cause no substantial change in the environment (no mitigation required).

No Impact: No adverse change to the environment would occur.

Potentially Significant: A potentially significant impact is one that may or may not occur and where a definite determination cannot be made. Feasible mitigation measures and/or project alternatives are identified to avoid or reduce the project's effects on the environment to a less than significant level.

Significant Impact: A significant impact would cause (or would potentially cause) a substantial adverse change in the physical conditions of the environment. Significant impacts are identified by the evaluation of project effects using specified standards of significance. Mitigation measures and/or project alternatives are identified to reduce project effects on the environment.

Significant Unavoidable Impact: A significant and unavoidable impact would result in a substantial change in the environment that cannot be avoided or mitigated to a less than significant level if the project is implemented.

Standards of Significance: A set of criteria used by the lead agency to determine at what level or "threshold" an impact would be considered significant. Significance criteria used in this EIR include the State CEQA Guidelines; factual or scientific information; regulatory performance standards of local, state, and federal agencies; and City goals, objectives, and policies.

PROJECT TERMS

The following terms are used throughout the Draft EIR.

City – City of Pittsburg.

Developer – Any person or other legal entity who performs actual construction activities that convert the project site to urban uses. Such activities include, but are not limited to, grading, building construction, and installation of infrastructure.

Draft EIR (DEIR) – Draft Environmental Impact Report.

Final EIR (FEIR) – Final Environmental Impact Report.

General Plan – The General Plan of the City of Pittsburg, adopted in 2001; various elements having been amended, the latest updates occurring in July 2010.

Municipal Code – The Municipal Code of the City of Pittsburg, current through September 20, 2010, as established by Ordinance 10-1328.

Project (or Proposed Project) – The proposed Master Plan.

Master Plan Area or Plan Area – The real property described by the project and in Section 3.0, Project Description, of this document.

ABBREVIATIONS

Many of the common abbreviations used throughout the Draft EIR are listed below.

AADT	average annual daily traffic
AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACS	American Community Survey
ADA	Americans with Disabilities Act
AF	acre-foot
AFA	acre-feet annually
APN	Assessor's Parcel Number
AQP	air quality plan
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
BCDC	Bay Conservation and Development Commission
BMP	best management practices
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CalEPA	California Environmental Protection Agency
Cal/OSHA	California Occupational Safety and Health Administration
Caltrans	California Department of Transportation
CAP	Clean Air Plan
CARB	California Air Resources Board
CA SDWA	California Safe Drinking Water Act
CBSC	California Building Standards Code
CCAA	California Clean Air Act

CCCFPD	Contra Costa County Fire Protection District
CCR	California Code of Regulations
CCTA	Contra Costa Transportation Authority
CCWD	Contra Costa Water District
CDE	California Department of Education
CDFG	California Department of Fish and Game
CDP	Census Designated Place
CDPH	California Department of Public Health
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CGP	Construction General Permit
CHP	California Highway Patrol
CH_4	methane
CIWMB	California Integrated Waste Management Board
CIWQS	California Integrated Water Quality System
CMP	Congestion Management Program
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalents
CPUC	California Public Utilities Commission
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
DA	Drainage Area
dB	decibel
dBA	A-weighted decibel
DDSD	Delta Diablo Sanitation District
DEIR	Draft Environmental Impact Report
DHS	Department of Health Services
DI	Delay Index
DOF	California Department of Finance

DOT	United States Department of Transportation
DPM	diesel particulate matter
DRM	Direct Ridership Model
DTSC	Department of Toxic Substances Control
DWD	Diablo Water District
DWP	Drinking Water Program
EIR	environmental impact report
EOP	Emergency Operations Plan
EPA	United States Environmental Protection Agency
ERP	Emergency Response Plan
ESA	federal Endangered Species Act
FAA	Federal Aviation Administration
FAR	floor area ratio
FEIR	Final Environmental Impact Report
FEMA	Federal Emergency Management Agency
FGC	Fish and Game Code
FHWA	Federal Highway Administration
FICON	Federal Interagency Committee on Noise
FTA	Federal Transit Administration
GHG	greenhouse gas
GIS	geographical information system
gpd	gallons per day
gpm	gallons per minute
GWP	global warming potential
HAP	hazardous air pollutants
HCD	California Department of Housing and Community Development
HCM	Highway Capacity Manual
HCP/NCCP	Habitat Conservation Plan and Natural Community Conservation Plan
HFC	hydrofluorocarbons
HOV	high-occupancy vehicle
HVAC	heating, ventilation, and air conditioning
in/sec	inches per second
ISO	Insurance Service Office
ITE	Institute of Transportation Engineers
IWMP	Integrated Waste Management Plan

kv	kilovolt
lbs/day	pounds per day
L_{dn}	day-night noise level
L_{eq}	energy equivalent noise level
L_{max}	maximum noise level
L_{min}	minimum noise level
LOS	level of service
LUFT	leaking underground fuel tank
MACT	maximum achievable control technologies
MBTA	Migratory Bird Treaty Act
MCE	maximum credible earthquake
MCL	maximum containment level
MDUSD	Mount Diablo Unified School District
MEP	maximum extent practicable
mgd	million gallons per day
mgy	million gallons per year
MMRP	Mitigation Monitoring and Reporting Program
MMT	million metric tons
mph	miles per hour
MRP	Municipal Regional Permit
msl	mean sea level
MTC	Metropolitan Transportation Commission
MXD	mixed-use development (transportation)
NESHAP	national emissions standards for hazardous air pollutants
NF_3	nitrogen trifluoride
NOC	Notice of Completion
NOP	Notice of Preparation
NO_2	nitrogen dioxide
No_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
OES	Office of Emergency Services
OFHEO	Office of Federal Housing Enterprise Oversight
OSHA	Occupational Safety and Health Administration
O_3	ozone
PCB	polychlorinated biphenyl

PFC	perfluorocarbons
PG&E	Pacific Gas and Electric
PM	particulate matter
PM_{10}	coarse particulate matter ($\leq$10 microns)
$PM_{2.5}$	fine particulate matter ($\leq$2.5 microns)
POTW	publicly owned treatment works
ppm	parts per million
ppv	peak particle velocity
PUC	Public Utilities Commission
PUSD	Pittsburg Unified School District
RCRA	Resource Conservation and Recovery Act of 1976
ROG	reactive organic gases
RWQCB	Regional Water Quality Control Board
RWF	Recycled Water Facility
SB	Senate Bill
SFBAAB	San Francisco Bay Area Air Basin
SFPD	School Facilities Planning Division
SF_6	sulfur hexafluoride
SIP	State Implementation Plan
SO_2	sulfur dioxide
SR	State Route
SRRE	Source Recycling and Recycling Element
SSMP	Sewer System Management Plan
SSO	sanitary sewer overflow
SWPPP	stormwater pollution prevention plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminants
TDM	Transportation Demand Management
TOD	transit-oriented development
TPY	tons per year
TSO	traffic service objectives
UBC	Uniform Building Code
UFC	Uniform Fire Code
UNFCCC	United Nations Framework Convention on Climate Change
USACE	United States Army Corps of Engineers

USC	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USPS	United States Postal Service
UST	underground storage tank
V/C	volume to capacity
VPD	vehicles per day
WCHB	West Coast Home Builders
WDR	waste discharge requirements
WEAP	worker environmental awareness program
WQMP	Water Quality Management Plan
WTP	Water Treatment Plant

Appendix B: NOP-IS and Comments

City of Pittsburg
Planning Department
Civic Center - 65 Civic Avenue, Pittsburg, CA 94565

Telephone: (925) 252-4920 • FAX: (925) 252-4814

NOTICE OF PREPARATION

To: State Clearinghouse
1400 Tenth Street
Sacramento, CA 95814

From: City of Pittsburg Planning Division
65 Civic Avenue
Pittsburg, CA 94565

Subject: **Notice of Preparation of a Draft Environmental Impact Report (EIR)**

The City of Pittsburg will be the Lead Agency and will prepare an environmental impact report for the project identified below. We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by our agency when considering your permit or other approval for the project.

The project description, location, and the potential environmental effects are contained in the attached materials. A copy of the Initial Study (☒ is ☐ is not) attached.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice.

Please send your response to Leigha Schmidt, Project Planner at the address shown above. We will need the name for a contact person in your **agency**.

Project Title: **Pittsburg / Bay Point BART Master Plan**

Project Applicant if any: **City of Pittsburg**

Date December 7, 2010

Signature [signature]
Title Project Planner
Telephone (925) 252-4015

Reference: California Code of Regulations, Title 14, (CEQA Guidelines) Sections 15082(a), 15103, 15375.

PROJECT DESCRIPTION: The City of Pittsburg Planning Division is preparing a Master Plan which, if adopted, would guide future development of approximately 50.6 acres in the vicinity of the Pittsburg/Bay Point BART station. This Pittsburg Bay Point BART Master Plan would describe allowed land uses and densities, transportation and circulation improvements, pedestrian pathways and improvements, urban design guidelines and standards, infrastructure development and financing, and phasing and implementation policies and guidelines. If adopted, the Master Plan would guide all new development in the Master Plan Area. Existing BART parking and bus facilities would be modified and improved, as described below, and the western half of the project site would be developed by the current property owner, West Coast Home Builders, as multi-family housing.

The proposed project is located in the western portion of the City of Pittsburg, approximately 700 hundred feet southwest of the intersection of State Route (SR) 4 and Bailey Road. The Master Plan Area is bounded by SR 4 to the north, the Oak Hills shopping center to the east, West Leland Road to the south, and the Alves Ranch project area to the west (see the attached Initial Study). The approximately 50.6-acre Master Plan Area encompasses APN's 097-160-044, 097-160-045, 097-160-049 and the majority of 097-160-041. The portion of APN 097-160-041 that lies outside the Master Plan Area contains the approach and exit ramps for the BART station, features that will not be modified by the proposed Master Plan. The incorporated boundary of the City of Pittsburg is located along SR 4, just north of the Master Plan Area. The area north of SR 4 lies within unincorporated Contra Costa County in the community of Bay Point.

The proposed project is a Master Plan describing mixed-use development on approximately 50.6 acres. The proposed Master Plan includes provisions for development of residential and commercial uses, including various densities of residential development, senior housing, retail and office uses, and integration of the BART station into a cohesive mixed-use development plan. Current surface parking will be relocated to parking structures, allowing for urban development of the remainder of the project area. The western half of the project would likely be developed as multi-family housing by the current property owner, West Coast Home Builders. See the attached Initial Study for a conceptual land use plan as well as the acres of each land use designation proposed by the Master Plan.

Through the Initial Study process, the Planning Division has determined that an Environmental Impact Report (EIR) must be prepared for the proposed project prior to any final decision regarding whether or not to approve the project. As determined through the Initial Study process, the EIR will be focused on areas of identified potential significant impact including:

- Aesthetics
- Air Quality
- Biological Resources
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Population and Housing
- Public Services
- Transportation and Traffic
- Utilities and Service Systems

The purpose of the EIR is to provide information about potential significant physical environmental impacts of the proposed project, to identify possible ways to minimize those significant impacts, and to describe and analyze possible alternatives to the proposed project if potential significant impacts are identified. Preparation of an NOP or EIR does not indicate a decision by the City to approve or disapprove the project. However, prior to making any such decision, the City Council must review and consider the information contained in the EIR.

Written comments on the scope of the Pittsburg Bay Point BART Master Plan Initial Study and EIR are welcome. **Please submit comments by 5:00 p.m. on January 7, 2011**. Written comments should be sent to Leigha Schmidt at 65 Civic Avenue, Pittsburg, CA 94565 or via email at lschmidt@ci.pittsburg.ca.us or via fax at 925-252-6941.

A public meeting will also be held at **7:00 p.m. on December 14, 2010** as part of the regularly scheduled Planning Commission Hearing, in order to discuss the scope of the EIR analysis. The meeting will be held in the City Council Chambers at City Hall, 65 Civic Avenue, Pittsburg. At this meeting, City staff and PMC (the consulting firm secured by the City to develop the Master Plan and EIR) will give a presentation of the EIR process and will take public comment on the Initial Study and EIR.

If you have any questions concerning the environmental review of the proposed project, please contact Leigha Schmidt at (925) 252-6941. However, please note that comments on the Initial Study/Draft EIR cannot be accepted over the phone. To be considered during preparation of the EIR, comments must be received in writing by the deadline discussed above.

Attachments: Initial Study

PITTSBURG/BAY POINT BART MASTER PLAN
INITIAL STUDY

Prepared for:

CITY OF PITTSBURG
65 CIVIC AVENUE
PITTSBURG, CA 94565

Prepared by:

PMC®

500 12TH STREET, SUITE 240
OAKLAND, CA 94607

DECEMBER 2010

INITIAL ENVIRONMENTAL STUDY

1) Project Title:	Pittsburg/Bay Point BART Master Plan
2) Lead Agency Name and Address:	Planning Department City of Pittsburg 65 Civic Avenue Pittsburg, CA 94565
3) Contact Person and Phone Number:	Leigha Schmidt, Project Planner (925) 252-4015
4) Project Location:	The Pittsburg/Bay Point BART Master Plan (Master Plan) is a proposed mixed use, transit-oriented land use program for the properties located adjacent to the existing Pittsburg-Bay Point BART Station. The proposed project is located in the western portion of the City of Pittsburg, several hundred feet southwest of the intersection of State Route (SR) 4 and Bailey Road. The Master Plan Area is bounded by SR 4 to the north, the Oak Hills shopping center to the east, West Leland Road to the south, and the Alves Ranch project area to the west (see **Figures 1 and 2**). The approximately 50.6-acre Master Plan Area encompasses APN's 097-160-044, 097-160-045, 097-160-049 and the majority of 097-160-041. The portion of APN 097-160-041 that lies outside the Master Plan Area contains the approach and exit ramps for the BART station, features that would not be modified by the proposed Master Plan. The incorporated boundary of the City of Pittsburg is located along SR 4, just north of the Master Plan Area. The area north of SR 4 lies within unincorporated Contra Costa County in the community of Bay Point.
5) Project Sponsor's Name and Address:	Same as Lead Agency (see above).
6) General Plan Designation(s):	The project site is currently designated as Mixed Use in the City of Pittsburg General Plan.
7) Zoning:	The current zoning on the project site is M (Mixed Use) District.
8) Description of the Project:	The proposed project is a Master Plan describing mixed-use development on approximately 50.6 acres. The proposed Master Plan includes provisions supporting the development of residential and commercial uses, including various densities of residential development, senior housing, retail and office uses, and integration of the BART station into a cohesive mixed-use development plan. Current surface parking is proposed to be

relocated to parking structures, allowing for urban development of the remainder of the project area. The western half of the project would likely be developed as multi-family housing by the current property owner, West Coast Home Builders. **Figure 3** illustrates the proposed site plan. While specific buildings are not described or designed by the proposed master plan, **Figure 4** illustrates the proportions of each land use expected to be developed in the Master Plan Area. In addition to typical residential and commercial land uses, the proposed Master Plan includes "flex" uses that may be developed as residential, retail, office, or quasi-public uses depending on market pressures at the time of development. Included in some locations would be ground-floor retail uses, co-located with flex uses (see **Figure 3**).

9) Surrounding Land Uses and Setting: The project site ranges in elevation from approximately 120 feet to 218 feet above mean sea level. The project site slopes down from south to north, from West Leland Road toward State Route 4. Much of the eastern half of the site is improved with asphalt parking for the BART station. Within the Master Plan Area, immediately east of the BART station parking, is a 3.45-acre lot that remains unimproved. The unimproved western portion of the site consists primarily of annual grasslands. A detention basin is present in the north-central portion of the site. To the south of the site are single family homes. To the east of the site is the Oak Hills shopping center and, beyond that, Bailey Road. **Figures 1** and **2** illustrate the project's regional and exact location.

10) Public agencies whose approval is required (e.g., permits, financing approval, or participation agreement): The proposed project is under jurisdiction of the City of Pittsburg. Actions that would be required from the City Council include, but are not limited to approval of the Master Plan. Approval from other public agencies is not required for approval of the Master Plan. However, eventual development of the Master Plan Area may require the approval, whole or in part, of the agencies listed below.

FUTURE APPROVALS EXPECTED BY THE CITY:

- Approval of a project Mitigation Monitoring and Reporting Program (MMRP)
- Approval of CEQA findings pursuant to State CEQA Guidelines Section 15091
- Rezoning to Master Plan Overlay District
- Design Review Entitlements
- Tentative Subdivision Map
- Final Map
- Grading Permit(s)
- Development Permit
- Improvement Plans
- Building Permit(s)

EXPECTED FUTURE APPROVALS BY OTHER AGENCIES

- Approval of Future Development Proposals by BART

- Section 404 Permit - The U.S. Army Corps of Engineers

- National Pollutant Discharge Elimination System (NPDES) Permit – Regional Water Quality Control Board (RWQCB) / State Water Quality Control Board (SWQCB)

- General Permit for Stormwater Discharges Associated with Construction Activities – Regional Water Quality Control Board (RWQCB) / State Water Quality Control Board (SWQCB)

- Stormwater Pollution Prevention Plan (SWPPP) – Regional Water Quality Control Board / State Water Quality Control Board (SWQCB)

- East Contra Costa County Habitat Conservation Plan

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☒	Aesthetics	☒	Greenhouse Gas Emissions	☒	Population and Housing
☐	Agricultural and Forest Resources	☒	Hazards & Hazardous Materials	☒	Public Services
☒	Air Quality	☒	Hydrology/Water Quality	☐	Recreation
☒	Biological Resources	☒	Land Use and Planning	☒	Transportation/Traffic
☐	Cultural Resources	☐	Mineral Resources	☒	Utilities & Service Systems
☒	Geology and Soils	☒	Noise	☒	Mandatory Findings of Significance

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Figure 1
Regional Location

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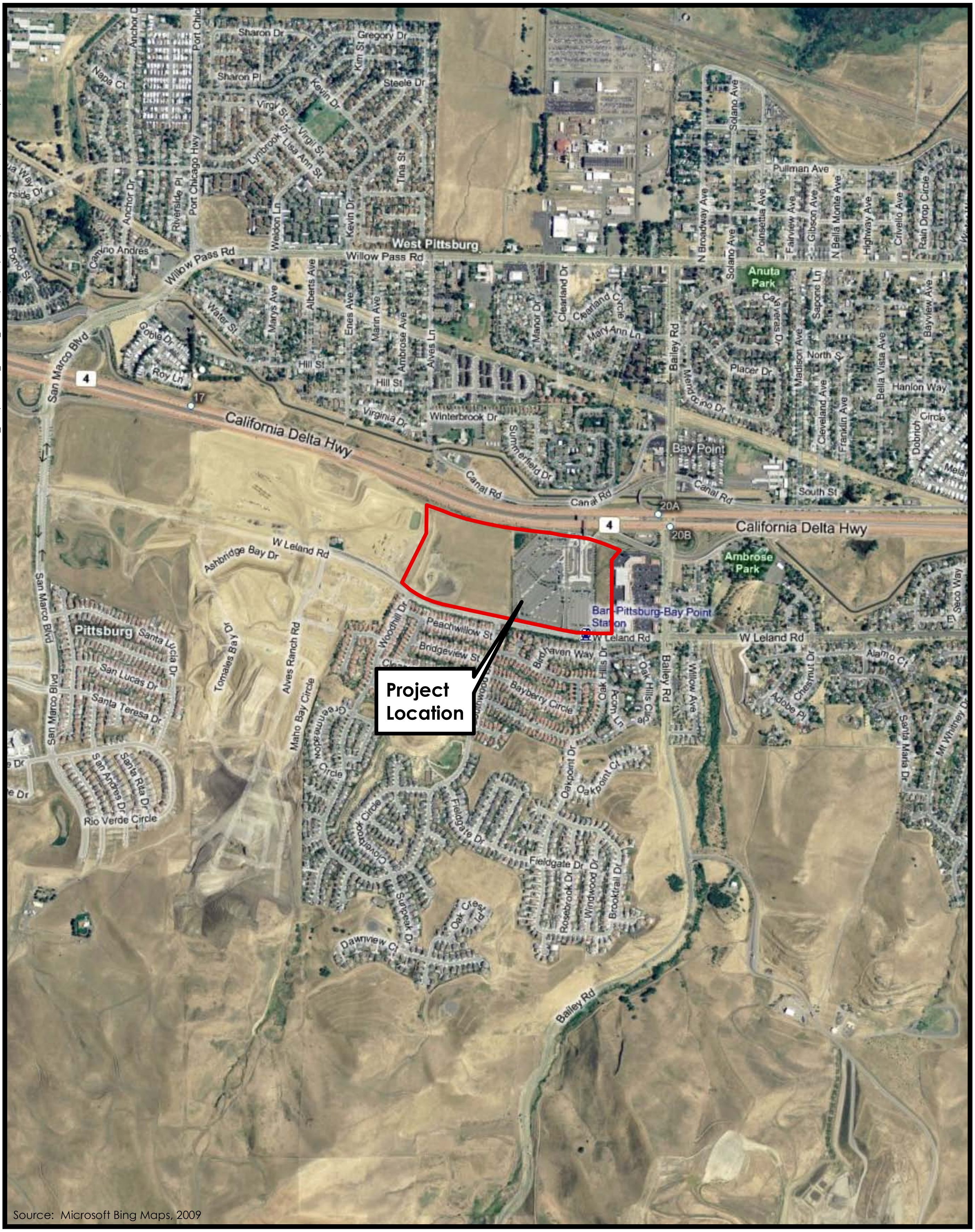

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Figure 2

Project Site

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Figure 3
Conceptual Site Plan

PMC

FIGURE 4
PROPOSED LAND USES – MASTER PLAN AREA

Land Use	Acres		
	Master Plan Area	WCHB Property	BART Property
Medium Density Residential	20.2	17.8	2.4
High Density Residential	4.2	0.0	4.2
Residential Subtotal	*24.4*	*17.8*	6.6
Flex	2.9	0.0	2.9
Ground-Floor Retail	1.3	0.0	1.3
Non-Residential Subtotal	*2.9*	*0.0*	*2.9*
Urban Plaza	1.1	0.0	1.1
Park	0.4	0.0	0.4
Detention Basin	1.8	0.8	1.0
Parking Garage 1	1.5	0.0	1.5
Parking Garage 2	1.8	0.0	1.8
Other	16.7	4.8	11.9
Subtotal	*23.3*	*5.6*	*17.7*
Project Total	**50.6**	**23.4**	**27.2**

Source: *Proposed Master Plan, Public Draft*

Notes: [1]*The acreage and maximum buildable square footage for Non-Residential uses is not a sum of the Flex and the Ground-Floor Retail uses because it is assumed that the retail will occupy the ground floor of the development with flex uses above.*

[2]*The Detention Basin acreage includes landscaping and fencing around that feature. See Section 4.9, Biological Resources for a discussion of the actual proposed size of the basin and its disposition.*

[3]*Other uses include the kiss-and-ride area, bus pickup and bus only lanes as well as landscaping, sidewalks, and roadway improvements to the centerline of roads adjacent to non-residential uses.*

PURPOSE OF THIS INITIAL STUDY

This Initial Study has been prepared consistent with CEQA Guidelines Section 15063, to determine if the Pittsburg/Bay Point BART Master Plan (project), as proposed, may have a significant effect upon the environment. Based upon the findings contained within this report, the Initial Study will be used in support of the preparation of an Environmental Impact Report.

EVALUATION OF ENVIRONMENTAL IMPACTS

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g. the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analysis," as described in (5) below, may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

   a) Earlier Analysis Used: Identify and state where they are available for review.

   b) Impacts Adequately Addressed: Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

   c) Mitigation Measures: For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions form this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:

    a) The significance criteria or threshold, if any, used to evaluate each question; and

    b) The mitigation measure identified, if any, to reduce the impact to less than significant

		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
I.	**AESTHETICS.** Would the project:				
a)	Have a substantial adverse effect on a scenic vista?	☒	☐	☐	☐
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c)	Substantially degrade the existing visual character or quality of the site and its surroundings?	☒	☐	☐	☐
d)	Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	☒	☐	☐	☐

DISCUSSION OF IMPACTS

a) ***Potentially Significant Impact.*** Views of rolling hills and several ridgelines are visible from the Master Plan Area to the south, southwest of the existing development surrounding the Pittsburg-Bay Point BART station. There are distant views of Suisun Bay and the Sacramento–San Joaquin River delta to the north and west of the Master Plan Area. The proposed project would be designed so as to maximize these views from the development. The City of Pittsburg General Plan notes that views of the hills to the south and Suisun Bay to the north create a sense of identity for City residents (City of Pittsburg, 2001, p. 4-2).

Areas located immediately north of the project site, including SR 4, may have diminished views of the hills south of the Master Plan Area as a result of the development in the Master Plan area. In addition, there is potential that the hills to the southwest would be less visible from the BART station, located immediately to the north of the Master Plan Area. There is also potential that delta views from properties to the south of the Master Plan Area to the north have the potential to be compromised by development of multi-story medium- and high-density residential proposed by the Master Plan. As these impacts are potentially significant, impacts related to the alteration of the existing visual character of the area will be further addressed in the EIR.

b) ***No Impact***. SR 4 forms the northern boundary of the Master Plan area, but it is not identified as a State scenic highway by Caltrans (Caltrans website, 2010). Approximately half of the Master Plan area is improved with asphalt parking for the BART station (most of the eastern half of the site, except for a strip along the far eastern border of the property) while the western portion of the site is vacant and covered with annual grasslands. There are no historic buildings on or adjacent to the project site. As the proposed project is not expected to include off-site improvements other than possible traffic improvements to surface streets and intersections, the proposed project would not impact any nearby historic buildings or historic resources. Likewise, there are no identified distinctive rock outcroppings within the project site. As such, no impacts related to scenic resources or views from a designated scenic highway would occur, and this issue will not be addressed further in the EIR.

c) ***Potentially Significant Impact***. Overall, the project would continue the existing urban development pattern of the surrounding area, including primarily residential development with some commercial/office development. Currently, the majority of the project site contains undeveloped grasslands and a BART parking lot. The Master Plan Area does not contain unique visual features, although the project would alter the visual characteristics of the Master Plan Area from open space and a parking lot to a mixed-use development project including medium- and high-density residential development, retail and commercial uses, and other improvements such as greenways, roadways, parking garages, and other ancillary uses on 50.6 acres. Single-family development is currently located immediately south of the Master Plan Area. The proposed project would require setbacks and landscaping to minimize visual impacts to existing surrounding development, particularly with regard to the residential units to the south of the Master Plan Area. The proposed project is not anticipated to substantially degrade the existing visual character or quality of the area; given that the Master Plan Area is located in an area surrounded by development and would continue the existing trend. However, the project does propose development that is higher in density and height than the residential development immediately to the south of the Master Plan Area. Therefore, based on the project's density and scale, impacts to existing visual character are considered a potentially significant impact. As such, this impact will be further addressed in the EIR.

d) ***Potentially Significant Impact***. While there are no existing sources of light and glare and no significant feature is included in the proposed project that would, by its nature or design, create a significant source of light or glare, additional sources of light associated with residential, retail, parking lots, and street lights and glare from vehicles entering and exiting the area would be introduced to the site as a result of implementation of the project through the construction of normal development in the Master Plan Area. This is considered a potentially significant impact and will be addressed in greater detail in the EIR.

		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
II.	**AGRICULTURE AND FOREST RESOURCES.** In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.				
a)	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c)	Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d)	Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e)	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

DISCUSSION OF IMPACTS

a) ***No Impact.*** The Master Plan Area does not include any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance as identified by the California Department of Conservation (2009). The western half of the Master Plan Area, which is unimproved grasslands, is mapped as grazing lands by the Farmland Mapping and Monitoring Program of the California Resources Agency (**Figure 4**). Land to the west of the Master Plan Area is also mapped as grazing land but is not used for grazing and has been approved for development (Alves Ranch project, approved January 20, 2009, for a mixed density residential Master Plan). The Master Plan Area is not used for agricultural resources, and it is not adjacent to existing agricultural operations. The Master Plan Area does not meet any of the criteria for designation as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. Therefore, no impact to conversion of farmland would occur and this issue will not be addressed in the EIR.

b) ***No Impact.*** The proposed Master Plan Area is currently designated as Mixed Use in the City of Pittsburg General Plan Land Use Diagram (City of Pittsburg, 2001, as amended in 2009). Adjacent parcels are zoned for commercial and residential uses under the City of Pittsburg General Plan (2001, p. 2-18). According to the General Plan Resource and Conservation Element, over 3,500 acres of land in the Planning Area is currently under Williamson Act contracts. However, agricultural areas are located within lands designated as Open Space on the General Plan Diagram (City of Pittsburg, 2001, p. 2-22 and 2-23). Neither the proposed project site nor adjacent properties are in agricultural use or under a Williamson Act contract as shown on the General Plan Diagram. Therefore, this issue will not be addressed in the EIR.

c) ***No Impact.*** The project site is zoned Mixed Use and is located in an area that is converting from undeveloped vacant land to urban uses. No forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g)) is located on or in the vicinity of the project site. Therefore, no impact would occur and this issue will not be addressed in the EIR.

d) ***No Impact.*** Refer to item c) above. The project does not contain any forest land. No impact would occur with regard to conversion of forest land to a non-forest use. This issue will not be addressed in the EIR.

e) ***No Impact.*** The proposed project is not located on lands that are currently used for agricultural uses. The site is planned for development and designated as Mixed Use on the City of Pittsburg General Plan Land Use Diagram. Therefore the project would not result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use. This issue will not be addressed in the EIR.

		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
III.	**AIR QUALITY.** Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a)	Conflict with or obstruct implementation of the applicable air quality plan?	☒	☐	☐	☐
b)	Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☒	☐	☐	☐
c)	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☒	☐	☐	☐
d)	Expose sensitive receptors to substantial pollutant concentrations?	☒	☐	☐	☐
e)	Create objectionable odors affecting a substantial number of people?	☒	☐	☐	☐

DISCUSSION OF IMPACTS

a) ***Potentially Significant Impact***. The Master Plan Area is located within the Bay Area Air Quality Management District (BAAQMD). The BAAQMD has planning responsibilities and permitting authority over stationary sources of pollutants and for achieving ambient air quality standards. The California Air Resources Board (CARB) regulates vehicular sources of pollutants.

BAAQMD is in the process of developing the *2010 Bay Area Clean Air Plan* as an update to the *Bay Area 2005 Ozone Strategy*. The *2010 Bay Area Clean Air Plan* addresses ozone, particulate matter, air toxics, and greenhouse gas emissions in a single integrated plan. On March 11, 2010, the BAAQMD released the *Draft Bay Area 2010 Clean Air Plan (CAP)*, as well as a Draft Programmatic Environment Impact Report on the CAP. (BAAQMD, 2009).

The San Francisco Bay Area Air Basin has a history of violations of federal and state ambient air quality standards for ozone, carbon monoxide, and PM_{10}. Since the 1970s, substantial progress has been made toward reducing ambient levels of these pollutants. Despite this progress, the Bay Area continues to exceed state and/or national ozone and PM standards on a limited number of days. The Bay Area is designated as non-attainment for ozone under both state and federal standards, and non-attainment for particulate matter less than 10 microns in size (PM_{10}) under state standards. For multiple years since 2000, the Pittsburg area has exceeded ozone standards (both state one-hour and national eight-hour standard), and state PM_{10} standard.

The California Air Resources Board (CARB) regulates vehicular sources of pollutants. CARB identifies diesel particulate matter as a Toxic Air Contaminant (TAC), known to be highly hazardous to public health, even in small quantities. CARB recommends that local authorities avoid siting new sensitive land uses within 500 feet of a freeway carrying 100,000 vehicles per day. SR 4 carries an estimated 122,000 vehicles per day in the vicinity of the Master Plan Area (City of Pittsburg, 2009, p. 26). Portions of the proposed development would be located less than 500 feet from the freeway, resulting in potentially significant impacts which will be addressed in the EIR.

The proposed project is expected to result in transit oriented development (TOD) on the project site and, as such, would provide air quality benefits by locating housing in close proximity to transit services, thereby reducing vehicle miles traveled (VMT's). However, development of the project site may contribute to air pollutant emissions from motor vehicles, stationary sources and construction activities. In June 2010, BAAQMD adopted updated CEQA Guidelines for use by agencies conducting CEQA analysis of proposed projects. Included in these Guidelines are screening thresholds, above which it is safe to assume air quality impacts may be potentially significant. Even if flex uses proposed by the Master Plan (see Figure 3) are ignored, the residential units and square footage of retail uses proposed by the Master Plan exceed the screening threshold established by the June 2010 Guidelines. As such, the proposed project is expected to result in a potentially significant impact and this issue will be addressed further in the EIR.

b & c) ***Potentially Significant Impact***. See a) above. The Pittsburg area has experienced years where it has exceeded ozone standards (both the state one-hour and national eight-hour standard), and the State PM_{10} standard. The San Francisco Bay Area is designated as non-attainment for ozone under both state and federal standards, and non-attainment PM_{10} under state standards. Implementation of the proposed project may potentially contribute to a net increase in air pollution as the region continues to develop. Implementation of the proposed project may contribute to potential violations and exceed established BAAQMD standards. Therefore, this issue, including the project's cumulative contribution to emissions, will be addressed further in the EIR.

d) ***Potentially Significant Impact***. Areas adjacent to the project site may be exposed to pollutant concentrations during both construction and operational phases of the proposed project. Construction air quality impacts are generally attributed to dust generated by equipment and vehicles, as well as diesel emissions from construction and earth-moving equipment. Additional construction emissions would be generated by trucks idling on the site and vehicles traveling to and from the project site. Fugitive dust is emitted both during construction activity and as a result of wind erosion over exposed earth surfaces. Soil type and soil moisture are also factors in determining dust generation. Construction activities would involve the use of a variety of gasoline or diesel powered equipment that emits exhaust fumes. The amount of TACs generated during construction of individual projects would vary depending on numerous factors, including the type, age, and number of pieces of equipment required, and hours of use. Without detailed construction information (i.e., construction schedules, demolition, grading, excavation, and construction requirements), construction-generated emissions of TACs for individual projects cannot be quantified at this time. Though the site is located adjacent to existing housing, and no schools or day care centers are located within one-half mile of the project site (Google Maps, 2010), sensitive receptors such as the elderly and children may be exposed to these pollutants and be exposed to nuisance dust and heavy equipment emission odors (e.g. diesel exhaust) during construction. Impacts resulting from construction and operation could be potentially significant and will be addressed in the EIR.

e) ***Potentially Significant Impact.*** See d) above. Some objectionable odors may result from construction activities, but these would be temporary in nature. In addition, the City of Pittsburg's Municipal Code, PMC Section 18.82.045, prohibits the emission of unreasonable, disturbing, or unnecessary odors. The proposed residential and commercial uses are not generally associated with objectionable odors. However, due to the potential for odor emissions during construction activities, this issue will be addressed in the EIR.

		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
IV.	**BIOLOGICAL RESOURCES.** Would the project:				
a)	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
c)	Have a substantial adverse effect on federally protected wetlands, as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.), through direct removal, filling, hydrological interruption or other means?	☒	☐	☐	☐
d)	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☒	☐	☐	☐
e)	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
f)	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

a) ***Potentially Significant Impact***. Vegetation along the SR 4 right-of-way is dominated by ruderal species. The annual grassland community provides habitat for a variety of wildlife species. However, because these areas are highly disturbed and fragmented, they have limited value to wildlife. Animal species using these areas are mostly those adapted to human environments. However, at least two raptor species have been observed in area grasslands. These are the red-tailed hawk and American kestrel, which use the grassland for foraging (Contra Costa County/City of Pittsburg, 2001, p. 15-2). Additional raptors likely to use grassland include the turkey vulture, red-shouldered hawk, and possibly several owl species. Other bird species commonly inhabiting annual grasslands that could be present on the project site include the western meadowlark, horned lark, Say's phoebe, and savannah sparrow. Grasslands also provide habitat for various reptiles, including the western fence lizard, western skink, common garter snake and western rattlesnake. Lizards may be particularly common in vacant lots. Mammals commonly found in annual grasslands include a number of small rodents, such as the California vole, western harvest mouse, house mouse, Botta's pocket gopher, and deer mouse. During a biological site visit, jackrabbits, voles, gophers, and fence lizards were observed on the project site and raptors were seen foraging the area (PMC, 2009). Ground squirrels are common in the surrounding grassland and in the larger open graded areas in the project area. The project site generally lacks suitable habitat for larger mammals, such as deer or coyote.

A triangular-shaped water detention basin is located along the northern boundary of the Master Plan Area, halfway between the western and eastern boundaries of the Master Plan Area, just south of SR 4. The bottom of the basin supports a stand of cattails. This detention basin is approximately 1.0 acre in size (PMC, 2009). The proposed Master Plan includes the potential for this detention basin to be expanded according to the drainage needs of the project site, specifically the western half of the Master Plan Area. In addition to the detention basin, several cement-lined canals cross the property. These were found to contain no biological resources during the biological site visit (PMC, 2009).

The following special-status species have the potential of occurring in the Master Plan Area: round-leaved filaree, tricolored blackbird, burrowing owl, and migratory birds. Preparation of the EIR will include an evaluation of the existing biological habitat type and quantity on the project site, and will address the potential for the proposed project to result in significant impacts to protected plant and animal species. These impacts will be discussed fully in the EIR.

b) ***Potentially Significant Impact***. See response a) above. The project site contains a detention basin, which is a potential wetland. While the proposed project would retain this feature, it may be expanded as a result of site development. The project is proposed to include setbacks from the basin for development so as not to indirectly impact the basin or related habitat. However, as direct impacts to the basin may occur, the proposed project may have a potentially significant effect. This potential effect will be addressed in the EIR.

c) ***Potentially Significant Impact***. See responses a) and b). Potential impacts to the on-site drainage basin, which may qualify as a wetland, will be addressed in the EIR.

d) ***Potentially Significant Impact***. The undeveloped portion of the Master Plan Area and surrounding area are suitable foraging habitat for birds, potentially including special-status migratory birds (i.e., raptors), and project implementation may impede the use of or adversely affect those existing habitats. Otherwise, due to the surrounding urban uses to the north, east, and south, the Master Plan Area does not serve as a migratory corridor. Loss of this habitat by development of the undeveloped portion of the Master Plan Area could be potentially significant and will be addressed in the EIR.

e) ***Potentially Significant Impact***. See discussions b), c), and d) above. The City of Pittsburg General Plan identifies a number of policies intended to protect biological resources, including protection of conservation areas, particularly habitats that support special-status species (species that are state or federally listed as endangered, threatened, or rare) guidance for development in such a way that preserves significant ecological resources; support of the reclamation of wetlands and marshlands along local industrial waterfronts; and minimization of runoff and erosion caused by earth movement by requiring development to use best construction management practices. The proposed project's consistency with these policies will be discussed in the EIR.

f) **Potentially Significant Impact**. The City of Pittsburg is covered by the East Contra Costa County Habitat Conservation Plan/Natural Communities Conservation Plan (ECCC HCP/NCCP). The purpose of the ECCC HCP/NCCP is to protect and enhance diversity and function within the rapidly urbanizing regions of eastern Contra Costa County (City of Pittsburg, 2009, p. 32). For project sites larger than one acre and identified as containing ruderal land cover types, the HCP requirements include the submittal of an HCP application and payment of applicable HCP fees prior to the issuance of a grading or building permit. Application of this regulation in the HCP would ensure that the proposed project does not adversely affect implementation of the HCP and thus a less than significant impact is expected. However, as this cannot be determined until full review of the project is undertaken, the impact is considered potentially significant and this issue will be addressed further in the EIR.

		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
V.	**CULTURAL RESOURCES.** Would the project:				
a)	Cause a substantial adverse change in the significance of a historical resource as defined in 15064.5?	☐	☐	☐	☒
b)	Cause a substantial adverse change in the significance of an archaeological resource pursuant to 15064.5?	☐	☐	☒	☐
c)	Directly or indirectly destroy a unique paleontological resource or site or unique geological feature?	☐	☐	☒	☐
d)	Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

a) ***No Impact.*** Pittsburg played an important role in the history of Contra Costa County. As one of the earliest industrial centers in the county, the City historically contained a broad range of human activities including numerous historic buildings, mining camp sites and facilities, ranches, and railroad facilities (City of Pittsburg, 2004, p. 12-2).

Inventories pertaining to the City of Pittsburg's historic resources have been compiled by Contra Costa County (the Historical Resources Inventory), the State Department of Parks and Recreation (the California Inventory of Historic Resources), and the California Office of Historic Preservation (which maintains the National Register of Historic Places). Eligibility for inclusion requires conformance to strict criteria. No structures or objects in the City of Pittsburg are listed in the National Register. According to a representative of the Pittsburg Historical Society and long-time resident in the vicinity of the project site, the project area does not contain significant historical resources (Contra Costa County/City of Pittsburg, 2001, pp. 16-1 and 16-2). Therefore, the project would not impact any known historical resources and this issue will not be addressed in the EIR.

b) ***Less than Significant Impact.*** Most Native American archeological sites that have been recorded in the City of Pittsburg area are in the form of small to large shell middens, some of which may contain human remains (City of Pittsburg, 1998, p. 178). These sites tend to be situated on alluvial flats and along historic bay margins, as well as near sources of water.

In 2001, a Specific Plan was proposed for the Pittsburg Bay View BART station area, which included most of the current Master Plan Area and extended well beyond it to the north. Archaeological surveys of portions of the Master Plan Area have not revealed the presence of any prehistoric or historic cultural resources (Contra Costa County/City of Pittsburg, 2001, p. 16-1). Further, no specific cultural resources were discovered or are known to occur in the Master Plan Area. The nearest prehistoric site is CA-CCo-609, a petroglyph located outside the Master Plan Area approximately 1.25 miles southeast of the intersection of State Route 4 and Bailey Road (Contra Costa County/City of Pittsburg, 2001, pp. 16-1 and 16-2).

While not likely, the possibility exists for unanticipated and accidental archaeological discoveries to occur during ground-disturbing project-related activities. Any unanticipated and accidental archaeological discoveries during project implementation have the potential to affect unique archaeological resources. This is considered a less than significant impact because the project would be subject to state requirements (e.g., Section 7050.5 of Health and Safety Code) for the protection of cultural resources. These requirements specify that all work within 100-feet of the discovery be stopped and an archaeological survey by a qualified professional be completed whenever there is evidence of an archaeological or paleontological site within a proposed project area. In addition, representatives of the Native American community must be consulted whenever necessary to ensure the respectful treatment of Native American sacred places. Any significant historical or archaeological impacts identified on the site must be mitigated in accordance with Section 7050.5 of Health and Safety Code. Therefore, compliance with state law would ensure that this impact is less than significant, and impacts to archaeological resources will not be addressed further in the EIR.

c) ***Less than Significant Impact.*** Refer to item d). Based on previous surveys, the proposed project should have no impact on a unique paleontological resource or site, or a unique geological feature. In the event a discovery is made, the provisions of Section 7050.5 of Health and Safety Code would mitigate impacts to a less than significant level. Therefore, impacts to paleontological resources are considered less than significant and will not be addressed further in the EIR.

d) **Less than Significant Impact.** Although it is not anticipated that any human remains would be encountered during project activities, the proposed project would be subject to the provisions of the California Health and Safety Code Section 7050.5 and California Public Resources Code Section 5097.94 et seq., regarding the discovery and disturbance of human remains. These provisions include contacting the Contra Costa County Coroner and the Native American Heritage Commission if the bone appears to be human. Therefore, potential impacts from the proposed project are considered less than significant, and this issue will not be addressed further in the EIR.

		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significan t Impact	No Impact
VI.	**GEOLOGY AND SOILS.** Would the project:				
a)	Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death, involving:				
	i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☒	☐	☐	☐
	ii) Strong seismic ground shaking?	☐	☐	☒	☐
	iii) Seismic-related ground failure, including liquefaction?	☒	☐	☐	☐
	iv) Landslides?	☐	☐	☒	☐
b)	Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c)	Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☒	☐	☐	☐
d)	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☒	☐	☐	☐
e)	Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒

DISCUSSION OF IMPACTS

a) i. ***Potentially Significant Impact***. No known active faults, or those which have had surface displacement within the last 11,000 years, are located in the Master Plan Area (Contra Costa County/City of Pittsburg, 2001, p. 14-2). However, several major active faults are sufficiently close to cause intense ground shaking during earthquake events. During an earthquake, the majority of Pittsburg is projected to experience ground shaking of intensity VII, which is associated with non-structural damage (City of Pittsburg, 2009, p. 38). Recent studies by the United States Geological Survey (USGS) indicate there is a 63% probability of a maximum credible earthquake (MCE) of magnitude 6.7 or higher earthquake in the San Francisco Bay Area in the next 30 years (City of Pittsburg, 2009, p. 40). The Master Plan Area would experience a range of ground shaking effects during an earthquake on a Bay Area fault.

The main trace of the San Andreas fault is located approximately 40 miles west of the Master Plan Area. In addition, the Hayward fault is located approximately 20 miles west, while the Calaveras fault is 10 miles southwest of the Master Plan Area. The Concord fault is approximately 6.5 miles southwest, the Clayton-Greenville fault is approximately 3 miles southwest, and the Antioch fault is located approximately 6.5 miles east of the Master Plan Area. The San Andreas fault is considered to be capable of producing a maximum credible earthquake (MCE) of magnitude 8.0. Both the Hayward and Calaveras faults could produce MCEs of magnitude 7.5, while the Concord-Green Valley, the Clayton-Greenville, and the Antioch faults are classified as capable of producing MCEs between magnitude 6.3 and 6.9. Several potentially active faults, or faults that have experienced displacement within the last two million years, occur near the Master Plan Area. These include the Kirker Pass and the Black Diamond Area faults. Evidence exists that there has been extensive differential movement along a series of northwest-trending splays of the Kirker Pass and Clayton faults, which are centered within the Mount Diablo foothills and extend northward. These faults currently are considered to be inactive, and earthquakes they could generate likely would be of lesser magnitude than other regional faults and would not be expected to produce surface faulting in the Master Plan Area (Contra Costa County/City of Pittsburg, 2001, pp. 16-1 and 16-2). Due to potential for ground shaking to impact the proposed project, this issue will be addressed in the EIR.

ii. ***Less than Significant Impact***. Pittsburg is surrounded by seismically active regions and will occasionally experience earthquakes that could cause ground rupture, failure and shaking. Ground shaking is the most widespread hazard in the Master Plan Area. Damage to structures in the Master Plan Area resulting from an earthquake would depend on the length of the fault break, distance from the fault, the nature of the underlying ground materials, and the type of structures, their materials, and construction quality (Contra Costa County/City of Pittsburg, 2001, p. 14-3).

Under worst-case projections, the Master Plan Area would likely be subject to mostly 'moderate' damage, defined as primarily non-structural damage as well as minor non-threatening structural damage and a remote chance of life-threatening situations from structural elements (Contra Costa County/City of Pittsburg, 2001, p. 14-4) or lesser damage from earth shaking, assuming construction according to Uniform Building Code (UBC) specifications. All development within the Master Plan Area would be required to conform with UBC design specifications as well as California Building Code (CBC) specifications, which include special requirements for seismically active areas. This would reduce impacts associated with exposure to strong seismic ground shaking to less than significant. While application of these standards would likely reduce the impact to a less than significant level, this issue will be discussed further in the EIR.

iii. ***Potentially Significant Impact***. Alluvial fan and terrace deposits that underlie most of Pittsburg have low liquefaction potential, and upland areas that are underlain by bedrock have very low liquefaction potential (City of Pittsburg, 2001, p. 10-9). The Master Plan Area includes some lands classified as "moderately unstable", as shown on the City General Plan Geologic Hazards map (Figure 13-4 of the Existing Conditions Report) (City of Pittsburg, 1998). Both the City of Pittsburg and the Contra Costa County General Plans identify the need for geotechnical studies in association with land use decisions to identify geologic hazards (Contra Costa County/City of Pittsburg, 2001, p. 14-6). Therefore, development within the Master Plan Area would be required to prepare a geotechnical study and apply any recommendations regarding engineering of the project site. Preparation of a geotechnical report and compliance with its provisions would reduce seismic related hazards to less than significant. As such a study has not yet been conducted, the significance of this impact cannot be determined and the impact would be potentially significant. Therefore, this issue will be discussed further in the EIR.

iv. ***Less than Significant Impact.*** The topography of the project site is gentle with minimal areas of steep slopes that could present hazards. High slope areas are found in the extreme southern part of the Master Plan Area within drainages immediately east and west of Bailey Road between State Route 4 and West Leland Road. The project site's elevations range from approximately 120 feet to 218 feet above mean sea level. The project site slopes down from West Leland Road northward toward State Route 4. The site does not contain any features that would make it susceptible to landslide. Therefore, this impact is considered less than significant and will not be discussed in the EIR.

b) ***Less than Significant Impact***. Construction of the proposed project would involve grading and excavation activities that may result in substantial short-term wind and water driven erosion of soils. Soils within the Master Plan Area include Antioch Loam and Capay Clay. Antioch Loam has a moderate erosion hazard where exposed. There is little hazard of erosion where soil is exposed on Capay Clay. Project construction activities must implement practices to minimize short-term soil erosion (Contra Costa County/City of Pittsburg, 2001, p. 14-7). In addition, projects disturbing more than 1 acre in area are required to include a Stormwater Pollution Prevention Plan (SWPPP) and implement control measures (or Best Management Practices) to control discharges of pollutants from the project sites as part of a General Permit for Stormwater Discharges Associated with Construction Activities issued by the Regional/State Water Quality Control Boards. Through standard building practices and implementation of a SWPPP, the potential erosion associated with development of lands in the Master Plan Area would be reduced to a less than significant level.

c) ***Potentially Significant Impact***. Soils within the Master Plan Area are flatland soils, which dominate the alluvial slope from the base of the hills to the south to the Suisun Bay margin estuaries (Contra Costa County/City of Pittsburg, 2001, p. 14-1). Relatively small areas in the southwestern portion of the Master Plan Area have been mapped as "moderately unstable." These areas are located between State Route 4 and West Leland Road west of Bailey Road. Alluvial strata underlying portions of the Master Plan Area are not considered particularly susceptible to liquefaction. The Master Plan Area is deemed to have 'generally moderate to low' liquefaction potential (Contra Costa County/City of Pittsburg, 2001, p. 14-4). As described under item iii, both the City of Pittsburg and the Contra Costa County General Plans identify the need for geotechnical studies in association with land use decisions to identify geologic hazards. Preparation of a geotechnical report and compliance with its provisions would likely reduce impacts associated with soil stability to less than significant. However, as discussed in item (a)(iii) above, this issue will be addressed in the EIR.

d) ***Potentially Significant Impact***. Most of the Master Plan Area overlies Antioch Loam soil of flat to moderate slopes. This soil consists of well-drained soils overlying older mixed alluvial terrace and fan materials (Contra Costa County/City of Pittsburg, 2001, p. 14-1). Loam portions of this soil demonstrate low shrink swell potential, while clay portions may present high to moderate shrink-swell potential. Other portions of the Master Plan Area overlie moderately well-drained Capay Clay on gentle slopes. Soils of this type present high shrink-swell and subsidence potential (Contra Costa County/City of Pittsburg, 2001, p. 14-2). As described under item iii, both the City of Pittsburg and the Contra Costa County General Plans identify the need for geotechnical studies in association with land use decisions to identify geologic hazards. Preparation of a geotechnical report and compliance with its provisions would likely reduce impacts associated with expansive soils to less than significant. However, as with item (a)(iii) and (c) above, this impact will be addressed in the EIR.

e) ***No Impact***. Development within the Master Plan Area would tie into the existing sewer system for the Pittsburg area, rather than use septic systems. Furthermore, City Engineering Standards require that new development connect to the existing sanitary sewer system in the City, precluding the installation of an alternative wastewater disposal system. Because the proposed project would not result in the need for or installation of septic systems, the project would have no impact associated with soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems. As such, this issue will not be addressed in the EIR.

		Potentially Significant Impact	Less Than Significant with the Incorporated Mitigation	Less Than Significant Impact	No Impact
VII.	**GREENHOUSE GAS EMISSIONS.**	Would the project:			
a)	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☒	☐	☐	☐
b)	Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

a) ***Potentially Significant Impact.*** The proposed project would create a mixed-use, pedestrian and bicycle friendly, transit oriented development with a mix of residential, retail, and commercial uses in close proximity to each other. The project would also improve multi-modal circulation and pedestrian/bicycle accessibility between the on-site BART Station, the existing shopping center, and the entire project vicinity. Because the project is intended to reduce reliance on motorized transportation and encourage linkages between uses, the project is anticipated to reduce greenhouse gas emissions. However, some emissions would be associated with construction and operation of the proposed project and, thus, this issue will be addressed in the EIR.

b) ***Less Than Significant Impact***. Pittsburg joined Contra Costa County and its neighboring cities to form the Contra Costa County Climate Leaders program and has been developing its local Climate Action program since 2007. The City has completed its draft 2005 greenhouse gas inventory. However, the inventory has not been finalized or adopted by stakeholders. Once the inventory is finalized, the City will develop a strategic plan for reducing the emissions in the community consistent with the State's greenhouse gas reduction requirements. The plan will consist of programs that enable the community to reduce its gasoline costs and energy bills (City of Pittsburg, 2010).

The vast majority of greenhouse gases in Pittsburg are generated by heavy industry (primarily power plants) and traffic on SR 4. On a local level, residential and commercial greenhouse gas emissions can be reduced through upgrading appliances and lighting, installing solar panels, driving fuel efficient or electric vehicles, and alternative transportation such as biking and walking. The proposed project would encourage non-motorized vehicle transport by creating a development that provides access to BART as well as retail and commercial services and includes bike and pedestrian linkages to surrounding uses. Thus, the project would support efforts to reduce the emissions of greenhouse gases. The City of Pittsburg General Plan and other associated planning efforts such as the greenhouse gas inventory assume development of the project site for BART parking as well as medium- and high-density residential development. As such, the proposed project is likely to result in lower greenhouse gas emissions than those anticipated by local policies and plans and associated environmental impacts would be less than significant. This issue will not be addressed further in the EIR.

		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII.	**HAZARDS AND HAZARDOUS MATERIALS.** Would the project:				
a)	Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?	☐	☐	☒	☐
b)	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c)	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
d)	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☒	☐	☐	☐
e)	For a project located within an airport land use plan area or, where such a plan has not been adopted, within two miles of a public airport or a public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f)	For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g)	Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan?	☒	☐	☐	☐
h)	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☒	☐	☐	☐

DISCUSSION OF IMPACTS

a) ***Less than Significant Impact.*** The proposed project would result in the limited use, transportation, and storage of hazardous materials during both construction and operational phases. The uses and storage would include small amounts of solvents, lubricants, paints, fertilizers, and other hazardous materials commonly required for the construction and maintenance activities associated with residential, retail, and commercial developments. Once operational, the project would utilize limited transport and use of hazardous materials related to operation of residential and commercial development, including pesticides, herbicides, fertilizers, and other similar compounds. The project must comply with all federal, state and local regulations regarding the transportation of hazardous materials. Compliance with these regulations would result in less than significant impacts. As such, this issue will not be addressed further in the EIR.

b) ***Less than Significant Impact.*** The proposed project would foster mixed-use development comprised primarily of residential uses. The most common types of hazardous materials found in households include bleach, paint thinner, and other common, yet toxic, household products. Specific types of commercial uses have not been identified. However, existing local, state, and federal regulations regarding the appropriate, legal use, storage and disposal of hazardous materials associated with household and commercial uses (e.g. dry cleaners' disposal of solvents) would ensure that the potential for accidental release of toxins into the environment is less than significant. Therefore, the potential for the accidental release of hazardous materials into the environment is considered less than significant, and this impact will not be addressed in the EIR.

c) ***Less than Significant Impact***. Several schools are located in the vicinity of the Master Plan Area. Bel Air Elementary School at 633 Canal Road is the closest school to the Master Plan Area and is located approximately 0.3 miles to the northeast. Thus, the Master Plan Area is located more than 0.25 miles from the nearest school. As discussed in impacts a) and b) above, implementation of the project is not anticipated to result in the accidental release or routine use or transport of significant hazardous materials. Thus, a less than significant impact is anticipated, and this issue will not be further addressed in the EIR.

d) ***Potentially Significant Impact***. The Master Plan Area is not located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Several sites are located in the vicinity of the Master Plan Area including Woodhill Drive at West Leland Road approximately 200 feet west of the project site (open/inactive as of May, 2009, source of contamination unspecified) as well as two Leaking Underground Storage Tank sites located approximately 2,000 feet northeast of the project site (Shell gas station, 261 Bailey Road, soil contaminated with gasoline, completed - case closed as of July, 2000) and Cheaper, 254 Bailey Road, diesel contamination, completed - case closed as of 2/2/2006)(GeoTracker, 2009). Additional on-site conditions may exist as a condition of past use, adjacent uses such as the nearby freeway, or other environmental factors. As a specific study of these factors, such as Phase I Environmental Site Assessment, has not yet been undertaken by either the property owners or the City of Pittsburg, the hazard posed by conditions in the Master Plan Area or its environs cannot be known and the impact is potentially significant. As such, this issue will be addressed further in the EIR.

e) ***No Impact***. The Master Plan Area is not located in an airport land use plan or within two miles of a public airport or public use airport. The nearest airport to the project site is Buchanan Field, located approximately 6.2 miles to the west of the Master Plan Area. As such, no impacts are anticipated and this issue will not be addressed in the EIR.

f) ***No Impact***. See response e) above. The Plan Area is not located near a private airstrip, and therefore, would not result in a safety hazard for people residing or working in the project area. Therefore, no impact is anticipated, and this issue will not be addressed in the EIR.

g) ***Potentially Significant Impact***. n February, 2005 the City of Pittsburg approved an update to the City's Emergency Operations Plan that provides a blueprint for emergency management within the City in the case of a major earthquake, hazardous materials incident, flood, national security emergency, wildfire, landslide, dam failure, or other emergency. The Emergency Operations Plan guides the City's response to emergency in five phases: preparedness; increased readiness; initial response operations; extended response operations; and recovery operations. Construction and operation of the proposed project is not anticipated to directly affect the ability of local agencies to respond in case of emergency, or impact the implementation of the City's Emergency Operations Plan. While no specific feature of the proposed Master Plan is expected to directly hinder emergency response, traffic impacts of the proposed project could hinder response by impacting the local circulation system. These potential impacts will be addressed in the EIR. As such, this impact will be addressed further in the EIR as well.

h) ***Potentially Significant Impact***. The Master Plan Area is surrounded by development or areas proposed to be developed. However, currently, areas to the west of the Master Plan Area are vacant and dry for much of the year. As a result, fire risks are high. Implementation of the proposed project could result in a fire risk by introducing residential development abutting these wildlands and create an urban wildland interface (City of Pittsburg, 2004, p. 8-31). Failure to sufficiently reduce this urban wildland interface fire hazard could result in a potentially significant impact. As such, this issue will be discussed in the EIR.

		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
IX.	**HYDROLOGY AND WATER QUALITY.** Would the project:				
a)	Violate any water quality standards or waste discharge requirements?	☒	☐	☐	☐
b)	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☒	☐	☐	☐
c)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☒	☐	☐	☐
d)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?	☒	☐	☐	☐
e)	Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☒	☐	☐	☐
f)	Otherwise substantially degrade water quality?	☒	☐	☐	☐
g)	Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h)	Place within a 100-year flood hazard area structures that would impede or redirect flood flows?	☐	☐	☐	☒
i)	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of a failure of a levee or dam?	☐	☐	☐	☒
j)	Inundation by seiche, tsunami or mudflow?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

a) ***Potentially Significant Impact.*** Implementation of the proposed project could create new sources of urban runoff through an increase in the amount of impervious surfaces on the currently undeveloped portions of the Master Plan Area. The project could also include new runoff pollutants such as oil, gasoline, and other chemicals such as herbicides and pesticides. Increased impervious surfaces and subsequent runoff has the potential to adversely affect water quality. Therefore, this impact is considered potentially significant and the EIR will further evaluate the project-specific impacts.

b) ***Potentially Significant Impact***. The Master Plan Area would be served by the City of Pittsburg water treatment plant. The City of Pittsburg receives its raw water from a combination of two city wells and the Contra Costa Water District (CCWD), with CCWD representing the majority of the water supply (roughly 85 percent of the city's total supply). The source of the CCWD water is the Contra Costa Canal, which is a component of the Central Valley Project. The Master Plan Area is within the Pittsburg Plain groundwater basin, a 30-square mile elongated basin. The Pittsburg Plain groundwater basin aligns east-west along and parallel to SR 4 in the Master Plan Area. Water movement in the aquifer is to the north and recharges the Sacramento/San Joaquin River system (Contra Costa County/City of Pittsburg, 2001, p. 13-6). Drilling of a new groundwater well would not be necessary to serve the proposed project. However, implementation of the project would include paving of a portion of the site which could affect percolation and infiltration of surface runoff. Therefore, groundwater recharge could be affected by the proposed project, resulting in a potentially significant impact. As such, this issue will be addressed in the EIR.

c) ***Potentially Significant Impact***. Approximately half of the Master Plan Area is improved with asphalt parking for the BART station (covering most of the eastern half of the site, except for a strip along the far eastern border of the property). The unimproved western portion of the Master Plan Area consists primarily of annual grasslands. Conversion of the vacant portion of the Master Plan Area to mixed-use development would alter the existing drainage pattern and increase the amount of impervious surfaces. Grading activities required to prepare the project site for development could increase onsite soil erosion, which could lead to increased sedimentation within downstream drainage facilities. Sedimentation could increase turbidity in the Suisun Bay discharge channel and reduce flow capacities if it settles out within the flood control system, creating a need for increased maintenance (City of Pittsburg, 2004, p. 10-29). As construction of the proposed project has the potential to cause erosion and other changes to the drainage of the site, the impact is potentially significant. Therefore, drainage related impacts will be further addressed in the EIR.

d) ***Potentially Significant Impact***. See a) and c) above. Implementation of the proposed project would increase the rate and amount of surface runoff by introducing additional impervious surfaces. The additional impervious surfaces could potentially result in peak flows that exceed the planned capacity of downstream drainage systems (City of Pittsburg, 2004, p. 9-29). This effect would represent a significant impact and will therefore be addressed in the EIR.

e) ***Potentially Significant Impact***. See a) and c) above. Implementation of the proposed project has the potential to increase the amount of pollutants in runoff by introducing urban uses to the undeveloped portions of the Master Plan Area. Therefore, this issue will be addressed in the EIR.

f) ***Potentially Significant Impact***. See a) through e) above. The issue of degradation of water quality will be addressed in the EIR.

g) ***No Impact***. The Master Plan Area is not located within a 100-year flood zone as delineated on the Federal Emergency Management Agency (FEMA) current Flood Insurance Rate Maps. However, the FEMA Flood Rate Insurance Maps designate several areas within the vicinity of the Master Plan Area within the 100-year flood zone limit. These areas primarily include the areas associated with Lawlor Creek north of State Route 4 and east of Bel Air School and the portion of the creek south of West Leland Road. The 100-year flood zone associated with Lawlor Creek east of the interchange and north of State Route 4 extends from Canal Road north along the length of the stream to the Suisun Bay (Contra Costa

County/City of Pittsburg, 2001, p. 13-5). The flood zone is primarily restricted to the stream channel. Since the project site is not within a-100 year floodplain, implementation of the proposed project would have no impact, and as such, this issue will not be addressed in the EIR.

h) ***No Impact***. The proposed project does not identify any structures that might be built within the 100-year floodplain (refer to item g, above). Therefore, the project would have no impact and this issue will not be discussed further in the EIR.

i) ***No Impact***. The proposed project is not anticipated to expose people or structures to a significant risk of loss, injury or death as a result of levee or dam failure. While reservoirs are a part of the local water supply system, reservoirs are located more than seven miles east of the project. Distance and topography prevents water from those features reaching the project property. Furthermore, no such hazards are identified in the Health and Safety Element of the City's General Plan. The 2005 Emergency Operations Plan is noted as being in place to address a variety of hazards including dam failure (City of Pittsburg, 2005). According to the Emergency Operations Plan, there is no risk of dam failure to the City of Pittsburg (City of Pittsburg, 2005; p. 9). This includes the Master Plan Area. Therefore, potential flood related impacts are considered to have no impact. As such, this issue will not be addressed in the EIR.

j) ***Less than Significant Impact.*** Earthquakes can cause tsunami ("tidal waves") and seiches (oscillating waves in enclosed water bodies) in the Bay. Portions of the City located adjacent to Suisun Bay are susceptible to potential tsunami or seiche inundation (City of Pittsburg, 2001, p. 10-9). However, projected wave height and tsunami run-up is expected to be small in the interior portions of the San Francisco Bay. Some coastal inundation and damage could occur if a tsunami or seiche coincided with very high tides or an extreme storm. The Master Plan Area is located on the south side of State Route 4, more than 3.5 miles inland from Suisun Bay with elevations of less than 200 feet above sea level ((Contra Costa County/City of Pittsburg, 2001, p. 14-1). Therefore, the likelihood of a seiche or tsunami affecting the Master Plan Area is very low and impacts are considered less than significant. As such, this issue will not be addressed further in the EIR.

		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
X.	**LAND USE AND PLANNING**. Would the project:				
a)	Physically divide an established community?	☐	☐	☒	☐
b)	Conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☒	☐	☐	☐
c)	Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

a) ***Less Than Significant Impact***. Land uses surrounding the Master Plan Area include residential development to the east and south, vacant land to the west currently approved for more residential development, and State Route 4 to the north, across which lies more urban development similar to those land uses surrounding the Master Plan area. The proposed project would expand the existing development pattern in the area through eventual construction of residential, retail, and commercial uses. The proposed project does not include any design features or other characteristics that would divide an existing community. Furthermore, the proposed project, as a Master Plan for transit oriented development, would improve interconnections between local land uses and other such development through expanded access and use of the BART station and the retail and commercial uses that would be constructed following adoption of the proposed Master Plan. Therefore, the proposed project would not physically divide an established community and the impact would be less than significant. As such, this impact will not be addressed further in the EIR.

b) ***Potentially Significant Impact***. The project site is currently designated for Mixed Use development in the City of Pittsburg General Plan (2001). The proposed project is consistent with the current General Plan designation, and a General Plan amendment would not be required. However, there is a possibility that aspects of the project may conflict with existing regulations in the General Plan and those of Responsible Agencies, adopted for the purpose of avoiding an environmental effect. As this determination of consistency has not yet been made, the impact is considered potentially significant. The consistency of the proposed project with all applicable regulations will be included in the EIR.

c) **Less than Significant Impact**. See discussion on IV f). This issue will be addressed further in the Biological Resources section of the EIR.

		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XI.	**MINERAL RESOURCES**. Would the project:				
a)	Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b)	Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

DISCUSSION OF IMPACTS

a-b) ***No Impact***. According to the Resource Conservation Element of the General Plan, there are currently no significant mineral deposits or active mining operations in the City of Pittsburg Planning Area (City of Pittsburg, 2001, p. 9-4). Therefore, the Master Plan Area is not located in an area that is known to contain mineral resources, and implementation of the proposed project would not impact any locally or regionally valued mineral resources. This impact will not be addressed further in the EIR.

		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XII.	**NOISE.** Would the project result in:				
a)	Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies?	☒	☐	☐	☐
b)	Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☒	☐	☐	☐
c)	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☒	☐	☐	☐
d)	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☒	☐	☐	☐
e)	For a project located within an airport land use plan area or, where such a plan has not been adopted, within two miles of a public airport or a public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f)	For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

DISCUSSION OF IMPACTS

a) ***Potentially Significant Impact.*** The noise environment at the project site and vicinity is dominated by vehicular traffic on SR 4 and West Leland Road. Due to the close proximity of the freeway, residential units constructed within the Master Plan Area could be exposed to noise from SR 4 exceeding acceptable standards. This impact is considered potentially significant and will be examined further in the EIR.

b) ***Potentially Significant Impact***. Development in the Master Plan Area is expected to require typical construction methods utilized for similar urban development. Because a geotechnical analysis has not been conducted for the Master Plan Area and because specific development proposals have not been developed, the potential need for construction methods that can be significant sources of groundborne vibration – such as blasting, deep excavation, and other similar methods – cannot be determined. Therefore, groundborne vibration could occur in association with the proposed Master Plan. As such, this impact is considered potentially significant and will be addressed further in the EIR.

c) ***Potentially Significant Impact***. The proposed project would likely result in increased noise levels on the portion of the project site that is currently undeveloped by introducing mixed use development and associated traffic to a currently undeveloped area. This impact is considered potentially significant and will be addressed further in the EIR.

d) ***Potentially Significant Impact***. A temporary or periodic increase in ambient noise levels is likely to occur during the construction phase of the proposed project due to typical construction noise. The highest noise levels would be generated during grading activities, with lower noise levels occurring during building construction. Large pieces of earth-moving equipment such as graders, scrapers and bulldozers generate maximum noise levels of 80-to-85 dBA (Federal Highway Administration, 2010). Typical hourly average construction-generated noise levels are approximately 75dBA to 80 dBA at a distance of 100 feet during busy construction periods (Contra Costa County/City of Pittsburg, 2001, p. 14-16). As some temporary noise generated during construction of the proposed project may impact adjacent properties, this impact is considered potentially significant and will be addressed further in the EIR.

e)-f) ***No Impact***. The Master Plan Area is not located in an airport land use plan, or within two miles of an airport. Therefore, the project would not expose persons in the Master Plan Area to excessive aircraft noise levels and no impact would occur. Therefore, this issue will not be addressed further in the EIR.

		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII.	**POPULATION AND HOUSING**. Would the project:				
a)	Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	☒	☐	☐	☐
b)	Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐
c)	Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

a) ***Potentially Significant Impact***. The project would result in the direct addition of population to the site through the construction of residential units (see **Figure 4**). The project is consistent with the General Plan designation for the project site. Furthermore, development of this scale was anticipated by the City during preparation of the current General Plan and General Plan EIR. Therefore, the proposed project would not result in population growth beyond what has been anticipated as part of the General Plan and considered in the General Plan EIR. However, implementation of the project would, by its nature, increase population in an area currently containing parking and open spaces. Therefore, the impact is potentially significant, and this issue will be addressed in the EIR.

b) ***No Impact***. The Master Plan Area does not contain any residential structures. As a result, no residential development would be displaced in association with implementation of the proposed project that would necessitate construction of replacement housing elsewhere, and no impact would occur. As such, this issue will not be discussed further in the EIR.

c) ***No Impact***. See b) above. The project site does not contain any existing residential development and would not displace any people. No impact is expected in association with approval of the proposed project, and this impact will not be addressed further in the EIR.

		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV.	**PUBLIC SERVICES.** Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:				
a)	Fire protection?	☒	☐	☐	☐
b)	Police protection?	☒	☐	☐	☐
c)	Schools?	☒	☐	☐	☐
d)	Parks?	☒	☐	☐	☐
e)	Other public facilities?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

a) ***Potentially Significant Impact***. The Contra Costa County Fire Protection District (CCCFPD) provides fire protection suppression rescue and emergency medical services in the vicinity of the Master Plan Area. Development of the Master Plan Area would result in the addition of residential units as well as retail and commercial development (see **Figure 4**). This would result in an increase in demand for fire protection and emergency medical services. The CCCFPD collects fire services fees, which are levied on new development (City of Pittsburg, 2004, p. 8-26). These fees are anticipated to be sufficient to mitigate impacts associated with the need for new facilities, equipment and staffing if necessary. However, it has not yet been determined whether the growth anticipated by the proposed Master Plan would result in the need for additional fire protection facilities or equipment. As such, this impact is potentially significant and will be addressed further in the EIR.

b) ***Potentially Significant Impact***. The Pittsburg Police Department provides police service to areas within the Pittsburg city limits. The addition of residential units and commercial and retail development (see **Figure 4**) would increase calls for police assistance and expanded police patrols in the area. While the quantity of development expected in the future in the Master Plan Area is not likely to require additional police facilities, resulting in a less than significant impact, it cannot be determined with any certainty at this time whether the growth anticipated by the proposed Master Plan would result in the need for additional police facilities or equipment. As such, this impact is potentially significant and will be addressed in the EIR.

c) ***Potentially Significant Impact***. Public school service in the vicinity of the Master Plan Area is provided by the Mount Diablo Unified School District (MDUSD). This project includes a residential component that would increase demand for schools and related services in the area. As provided by state law, the MDUSD currently levies school impact fees per square foot of new commercial floor area and per square foot of new residential construction (City of Pittsburg, 2004, p. 8-34). The proposed project would be required to pay school impact fees to offset additional demand. Therefore, impacts to schools are anticipated to be less than significant. However, it has not yet been determined whether the growth anticipated by the proposed Master Plan would result in the need for additional school facilities. As such, this impact is potentially significant and will be addressed further in the EIR.

d) ***Potentially Significant Impact***. Development of the Master Plan Area, with a mix of residential and commercial uses, would result in additional people living in, working in, and visiting the project, thereby increasing demand for park services. The project includes 16,000 square feet of park. In addition, two parks (Ambrose and Oak Hills) are located in the vicinity of the Master Plan Area. The City's park requirements are based on the adopted standards of five acres of parkland per 1,000 residents. Chapter 17.32 of the City's Municipal Code sets forth detailed requirements for land dedication or fee in lieu of dedication. This code also describes the criteria for combining fee and dedication as well as credits for private open space (City of Pittsburg, 2004, p. 8-43). Developers of properties in the project area would be required to comply with the provisions of the City's Municipal Code. These requirements are considered adequate to mitigate impacts relative to provision of parks, and this impact is considered less than significant. However, the total number of residents expected to be generated by the proposed Master Plan has not been determined. As such, it cannot be determined at this time what environmental effects the provision of parks might have, and as such, the impact is potentially significant. The proposed project's consistency with these standards as well as any physical impact on parks will be addressed further in the EIR.

e) ***No Impact***. Development of the Master Plan Area would not result in the need for additional public facilities or require additional public services beyond those discussed in a) through d) above. This issue is considered to have no impact and will not be addressed in the EIR.

		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XV.	**RECREATION.**				
a)	Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b)	Does the project include recreational facilities, or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

a) ***Less than Significant Impact***. The proposed project includes a residential component that would increase population in the Master Plan Area and, therefore, demand for recreational facilities. Parks are proposed as part of the project, and two parks are located in the vicinity of the Master Plan Area (Ambrose Park and Oak Hills Park). The expected increase in population and associated increase in park users is not anticipated to result in a substantial physical deterioration of existing parks or recreational facilities in the vicinity of the Master Plan Area given that new park facilities would be included as part of the proposed project. Therefore, this impact is considered less than significant and will not be addressed further in the EIR.

b) ***Less than Significant Impact.*** The project includes land devoted to park uses. Potential impacts associated with construction of park facilities would be limited to minor ground disturbing activities, which have the potential to impact sensitive biological resources on the project site and result in associated construction air quality impacts. The potential for biological resources to be impacted by the project footprint will be fully addressed in the biological resources section of the EIR. Likewise, air quality impacts will be discussed in the air quality section. There are no other recreational facilities or structures proposed as part of the project, and the project would not result in the construction or expansion of any offsite recreational facilities. Impacts specific to development of on-site recreational facilities would be addressed in other sections of the EIR. Therefore, this impact is considered less than significant.

		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significa nt Impact	No Impact
XVI.	**TRANSPORTATION/TRAFFIC.** Would the project:				
a)	Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☒	☐	☐	☐
b)	Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☒	☐	☐	☐
c)	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d)	Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☒	☐	☐	☐
e)	Result in inadequate emergency access?	☒	☐	☐	☐
f)	Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☒	☐	☐	☐

DISCUSSION OF IMPACTS

a) ***Potentially Significant Impact***. The proposed project site includes an existing BART station at the terminus of the BART line in east Contra Costa County. The project takes into account all modes of transportation including mass transit and non-motorized travel (bicycle and pedestrian). The project would reduce reliance on vehicular travel but it would also change traffic volumes on surrounding roadways due to an increase in local population, employees, and visitors to the site. Impacts of the project with regard to the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit are potentially significant and will be examined in the EIR.

b) ***Potentially Significant Impact***. See a) above. The proposed project would reduce congestion by creating a development that fosters non-motorized transportation. However, the project could impact levels of service on surrounding roads and State Route 4. The project's consistency with applicable congestion management programs, including, but not limited to level of service standards and travel demand measures for designated roads or highways will be examined in the EIR.

c) ***No Impact***. The project site is not located within the airport safety zones or within the approach and departure paths for aircraft using the Buchanan Field, approximately six miles to the west. Therefore, no impacts are anticipated and this issue will not be addressed in the EIR.

d) ***Potentially Significant Impact***. The proposed project includes the construction of residential units and commercial/retail development (see **Figure 4**) as well as access roads and an internal circulation network (see **Figure 3**). These components of the proposed project could result in an increase in trip generation and traffic offsite. As such, there is the potential for vehicles traveling to and from the project site to interfere with existing roadway traffic, resulting in potentially significant unsafe conditions. This issue will be addressed in the EIR.

e) ***Potentially Significant Impact***. Specific access points for emergency access have not been identified at this point. However, project design could result in potentially significant impacts to emergency access. Therefore, this impact will be addressed further in the EIR.

f) ***Potentially Significant Impact***. The Master Plan Area includes the Pittsburg/Bay Point BART Station. The project would create a mixed-use, pedestrian and bicycle friendly, transit oriented development with a mix of residential, retail, and commercial uses in close proximity to each other. The project would also improve multi-modal circulation and pedestrian/bicycle accessibility between the BART Station, the existing shopping center to the east, and properties in the vicinity of the station. Links would be created throughout the project area to facilitate multi-modal (pedestrian, bicycle and transit) access to and from the BART Station. Thus, the project would support public transit, bicycle, and pedestrian facilities, and improve the performance or safety of such facilities. Regardless of the proposed project's benefits to these facilities, the public transit, bicycle, and pedestrian circulation will be discussed further in the EIR. Furthermore, as the proposed project's consistency with adopted policies, plans, and/or programs cannot yet be determined, this impact is considered potentially significant, and an analysis of the project's consistency with adopted policies, plans, and/or programs will be included in the EIR.

		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVII.	**UTILITIES AND SERVICE SYSTEMS.** Would the project:				
a)	Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☒	☐	☐	☐
b)	Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☒	☐	☐	☐
c)	Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☒	☐	☐	☐
d)	Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☒	☐	☐	☐
e)	Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand, in addition to the provider's existing commitments?	☒	☐	☐	☐
f)	Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g)	Comply with federal, state and local statutes and regulations related to solid waste?	☐	☐	☒	☐

DISCUSSION OF IMPACTS

a) ***Potentially Significant Impact.*** By constructing new residential, retail and commercial uses, the proposed project would increase wastewater flows, requiring treatment. Wastewater generated by development in accordance with the proposed project would be conveyed to and treated at the Delta Diablo Sanitation District wastewater treatment plant, located north of the Pittsburg-Antioch Highway in the City of Antioch. Implementation of the project would increase the amount of residential, retail and commercial wastewater flows to the DDSD's wastewater treatment plant. Because the project does not include flows from industrial or manufacturing operations, the project's impact on wastewater treatment requirements of the Regional Water Quality Control Board are not anticipated to be impacted. However, as implementation of the proposed project would create additional wastewater flows this impact is potentially significant and will be addressed in the EIR.

b) ***Potentially Significant Impact.*** The proposed project is consistent with the City of Pittsburg General Plan land use designations for the project site. The Pittsburg General Plan EIR states that new development may generate wastewater flows that exceed collection and treatment capacities available through City and Delta Diablo Sanitation District facilities and identifies this impact as potentially significant (City of Pittsburg, 2004, p. 8-18). The proposed project would result in increased wastewater flows in association with development proposed within the Master Plan Area. This impact is therefore considered potentially significant and will be addressed in the EIR.

c) ***Potentially Significant Impact***. Most of the eastern portion of the project site is currently covered with an asphalt parking lot. The western portion is vacant and contains a detention basin. The basin would be retained within the Master Plan Area. However, the proposed project would require new storm water drainage facilities and must comply with all RWQCB standards. This impact is considered potentially significant and will be addressed in the EIR.

d) ***Potentially Significant Impact***. Development in accordance with the proposed project would include construction of residential units and commercial/retail square footage in the Master Plan Area, resulting in an increase in demand for water supply to the project site. The Master Plan Area would be served by the City of Pittsburg's water system and as previously stated, the city generally receives its untreated water from the Contra Costa Water District (CCWD). The source of CCWD water is the Contra Costa Canal, which is a component of the Central Valley Project. The Master Plan Area is located within the Pittsburg Plain groundwater basin, a 30-square mile elongated basin. The City of Pittsburg recently adopted a Water System Master Plan (2010), which addressed water supply needs for various vacant sites throughout the city, including the Master Plan Area. The proposed project was included in growth assumptions used in the Water System Master Plan. Therefore, growth created by the proposed project would not likely increase demand beyond that expected in the region. However, as the proposed project would result in some increase in water usage, this impact is potentially significant and will be addressed further in the EIR.

e) ***Potentially Significant Impact***. See item b) above. Increased wastewater flows from the proposed project will be addressed further in the EIR.

f-g) ***Less than Significant Impact***. Pittsburg Disposal Services provides solid waste pick-up and disposal service for areas within the Pittsburg city limits and for a small portion of Bay Point. Residential and commercial solid waste is disposed of at the Potrero Hills Landfill located east of Suisun City in Solano County as well as the Mt. Diablo Recycling Center, located in the City of Pittsburg. Non-recyclable industrial waste is transported to Keller Canyon Landfill located southeast of the Pittsburg City limits (City of Pittsburg, 2004, p. 8-46). The increase in solid waste generated associated with the proposed project is anticipated to be less than significant but will be addressed further in the EIR.

		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVIII.	**MANDATORY FINDINGS OF SIGNIFICANCE**				
a)	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wild-life population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of rare or endangered plants or animals, or eliminate important examples of the major periods of California history or prehistory?	☒	☐	☐	☐
b)	Does the project have impacts that are individually limited, but cumulatively considerable? "Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.	☒	☐	☐	☐
c)	Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☒	☐	☐	☐

DISCUSSION OF IMPACTS

a) ***Potentially Significant Impact***. The EIR will address the potential for the proposed project to result in impacts to the habitat quality or viability of plant, animal and fish species. No potentially significant impacts are anticipated with regard to eliminating important examples of the major periods of California history or prehistory, as described under checklist V above.

b) ***Potentially Significant Impact***. Due to the nature of the proposed project, development of the Master Plan Area may contribute to cumulative impacts of a significant nature in multiple areas. Changes to the drainage pattern of the site, increases in stormwater runoff, erosion of topsoil (induced by grading activities), and other such significant changes to the landscape may occur with project implementation. Also, modifications to the site have the potential to affect sensitive or special-status species. For these reasons, the cumulative impacts associated with development of the project site and surrounding areas are determined to be of a potentially significant nature and will be further studied in the EIR. A detailed analysis of these potentially cumulatively significant impacts will be included and addressed in the EIR.

c) ***Potentially Significant Impact***. Potential project impacts such as air quality, climate change, hydrology/water quality, and fire hazards, could cause substantial adverse effects in human beings, either directly or indirectly. As such, these potential impacts will be further addressed in the EIR.

DETERMINATION

On the basis on this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet have been added to the project. A NEGATIVE DECLARATION will be prepared.

☒ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but must analyze only the effects that remain to be addressed.

☐ I find that, although the proposed project could have a significant effect on the environment, there will NOT be a significant effect in this case because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature	12/7/10 Date
Leigha Schmidt Printed Name	City of Pittsburg For

REPORT PREPARATION:

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REFERENCES

Bay Area Air Quality Management District (BAAQMD). *2010 Clean Air Plan*. Website http://www.baaqmd.gov/. Accessed July 8, 2009. Note: referenced in document as BAAQMD, 2009.

Bay Area Air Quality Management District (BAAQMD). July 2010. *California Environmental Quality Act Air Quality Guidelines*.

California Department of Conservation. 2009. *Department of Land Resource Protection Farmland Mapping and Monitoring Program Map for Contra Costa County*. Website ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2008/con08.pdf. Accessed July 15, 2010.

California Department of Transportation. 2010. *Officially Designated Scenic Highway, Contra Costa County.* (Caltrans website, 2010) http://www.dot.ca.gov/hq/LandArch/scenic_highways/index.htm. Accessed August 9, 2010.

City of Pittsburg, 2010. *Climate Action Pages*. Website. http://www.ci.pittsburg.ca.us/index.aspx?page=301. Accessed August 9, 2010.

City of Pittsburg. 2010a. *Water System Master Plan – Final Draft*. Prepared by AKEL Engineering Group, Inc.

City of Pittsburg. 2009, February 25. *Railroad Avenue Station Area Specific Plan Draft Environmental Impact Report.*

City of Pittsburg. 2005, February. *City of Pittsburg Emergency Operations Plan*. Revised January, 2005. Adopted by the City February, 2005.

City of Pittsburg, 2004. *Draft Environmental Impact Report for the Vista Del Mar Project*. June, 2004.

City of Pittsburg. 2001. *Pittsburg 2020: A Vision for the 21st Century*. City of Pittsburg General Plan. Includes Amendments through July 2010.

Contra Costa County/City of Pittsburg. 2001. *Pittsburg/Bay Point BART Station Area Specific Plan Environmental Impact Report (Recirculated)*. July, 2001.

Federal Highway Administration. 2010 (FHWA website, 2010). *Construction Noise Handbook.* Website. http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm. Accessed August 9, 2010

GeoTracker, 2009. Website. http://geotracker.swrcb.ca.gov. Accessed October 22, 2009.

Google Maps, 2010. Map: Daycare Centers near Pittsburg, CA. Website. http://maps.google.com/. Accessed August 9, 2010.

PMC. 2009, April 28. *Reconnaissance-level field survey conducted for the Master Plan Area by a PMC biologist to assess habitat types and current site conditions*.

January 4, 2011

Leigha Schmidt
Planning Division
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65 Civic Avenue
Pittsburg, CA 94565

Dear Ms. Schmidt,

Thank you for this opportunity to comment on the scope of the Environmental Impact Report for the Pittsburg/Bay Point Master Plan. We applaud the City's past efforts to plan for a walkable community with jobs, homes, and shops in the Railroad Avenue Specific Plan. We look forward to seeing the same regard for the future economic and environmental health of the community in the Pittsburg/Bay Point Master Plan.

We have appreciated the opportunities to connect with the city and consultants on our goals to promote development near transit where residents and workers of all income levels can easily access homes, jobs, shopping and local transportation. Considering these goals, we have a few concerns that we believe should be addressed through the environmental review process.

Transportation/Traffic
Safe and easy pedestrian and bicycle access are essential in creating a vibrant neighborhood where people can easily access jobs, shops, homes and services without the need for a car. More people walking and biking means a safer neighborhood, more viable retail, and healthier communities. Furthermore, providing transportation choices for residents is key to maintaining Pittsburg's appeal to future residents as housing demand for walkable, transit-oriented neighborhoods continues to grow.

Please consider the following issues in the Transportation/Traffic section of the EIR:

1. *Evaluate impacts of increased non-vehicle transportation trips.* We applaud the City's commitment to look beyond only vehicle level of service standards when examining project effects on the transportation network (page 45 of the Initial Study). Too often the only transportation impacts that are considered are those that affect vehicles and most cities' policies have only adopted thresholds for the vehicle environment. Additionally, many mitigation measures that are suggested to improve the vehicle transportation environment (roadway widening or measures to increase vehicle speeds) come at a direct expense to the pedestrian, bicycle and transit environments.

   In the City's Transportation Element, there are multiple goals and policies to support enhanced transit, walking and biking infrastructure including 7-G-14, 7-G-16, 7-P-33 and 7-P-34. To help meet these goals the environmental review is a critical exercise to discover the best ways to enhance the transportation environment for all modes in addition to cars and to make sure that vehicle mitigations don't come at the expense of other modes. We recommend using existing studies like BART's Pittsburg/Bay Point Station Access Plan (August 2002) or even better, a more recent study to consider the pre-project mode split of how riders access the station and documenting how the proposed project will impact the baseline. Proposed project elements should be examined by how they would impact mode split and ideally increase the amount of pedestrian, bicycle and transit access to the station. By using the most recent inventory of non-vehicle trips, the City can better gauge the shift towards non-vehicle modes of transportation and highlight the positive environmental impacts that the transit-oriented development (TOD) can bring.

2. *Consider implementation of proposed bicycle and pedestrian improvements as mitigations to increased vehicle traffic.* Contra Costa County recently adopted their new 2009 Bicycle and Pedestrian Plan. The Pittsburg/Bay Point BART Station Development (Project #203) is listed among the bicycle and pedestrian improvement projects. We strongly recommend that the environmental review consideration the following bicycle and pedestrian projects adjacent to the plan area:

    - *Bicycle Improvements on Bailey Road: Leland Rd to SR4 (Project #1440)*
    - *Bailey Road Pedestrian & Bicycle Improvements -State Route 4 Interchange Zone (Project #1489)*
    - *Bailey/Leland Intersection Improvements (Project #914)*

    These forthcoming improvements nearby would facilitate increases in non-vehicle trips to the Master Plan Area and BART Station. The environmental review should analyze how any improvements to vehicle LOS in the Master Plan will influence the effectiveness of these bicycle and pedestrian improvement projects.

3. *Use a traffic model that has trip generation assumptions that reflect the traffic reducing impacts of density, transit frequency, and other factors that may account for reduced traffic.* As a TOD, the Pittsburg/Bay Point station will have the benefit of proximity to transit, density and a mix of uses that will reduce projected vehicle miles traveled of future residents and workers, as well as contribute to reduced driving within the surrounding neighborhood. We recommend that the trip generation models used reflect assumptions such as density, transit frequency and mix of uses. The standard Institute for Transportation Engineers (ITE) model does not consider these factors and tends to over-project the amount of traffic. URBEMIS is a court-tested traffic modeling tool used by the Bay Area Air Quality Management District (BAAQMD) that takes into consideration the assumptions previously mentioned. In addition to modeling trips and vehicle miles traveled, it also is useful in modeling greenhouse gas emissions from motorized vehicles.

Air Quality

Air quality concerns are of particular importance in planning for development near freeways as residents living within 0'-500' of freeways are at increased risk for health problems.

As you mentioned in the initial study (page 19), BAAQMD recently adopted updated CEQA guidelines for project analysis. While new standards are created in order to better protect community health from the impacts of future development, it is important to note the challenges that these may create for any housing development in the plan area immediately adjacent to the freeway.

Please consider the following issue in the Air Quality section of the EIR:

1. *New BAAQMD screening tables may offer challenges to suburban housing development.* While the potential residential units and retail uses may exceed thresholds of exposure as set by the new CEQA guidelines adopted by BAAQMD in June 2010, the thresholds are still in flux and will not come into effect until May 2011. The current BAAQMD screening tables have been found to create false positives and false negatives, exaggerating the hazards to new residents, especially when analyzing suburban projects.

   These new standards are particularly challenging for affordable housing developers. When a proposed development fails the initial screening provided by BAAQMD, affordable housing providers have been required to hire expensive consultants, incurring unexpected costs on their projects. I have attached two case studies that Non-Profit Housing of Northern California (NPH) has conducted demonstrating the issues that affordable housing developers are experiencing with the new screening tables. Since the city continues to have unmet affordable housing needs, it should take caution in using the current screening tables as they may lead to greater challenges for development, especially for affordable housing providers. We recommend contacting BAAQMD staff to assist in analysis to get a more accurate evaluation of the Master Plan.

We appreciate the city's efforts to increase transportation choices for Pittsburg residents through smart planning, and we look forward to seeing our concerns addressed in the environmental review process.

Sincerely,

Camille Guiriba
Program Associate

Bay Area Air Quality Management District Screening Tables

These are two potential developments sites that NPH has run through the BAAQMD screening tables to demonstrate common problems that are being experienced by affordable housing developers throughout the Bay Area. The pictures are snapshots as depicted on the BAAQMD website when walking through the screening process. The blue dots are stationary sources. The numbers on the roadways are traffic volumes. The red circle shows 1000 feet from the center of the site. The tables show all of the sources of potential hazards and the values assigned for each category.

TAC Thresholds of Significance table:

	Cancer Risk	Chronic Hazard Index	Acute Hazard Index	PM 2.5 Levels
Individual Threshold	**10**	**1**	**1**	**.3**
Cumulative Threshold	**100**	**10**	**N/A**	**.8**

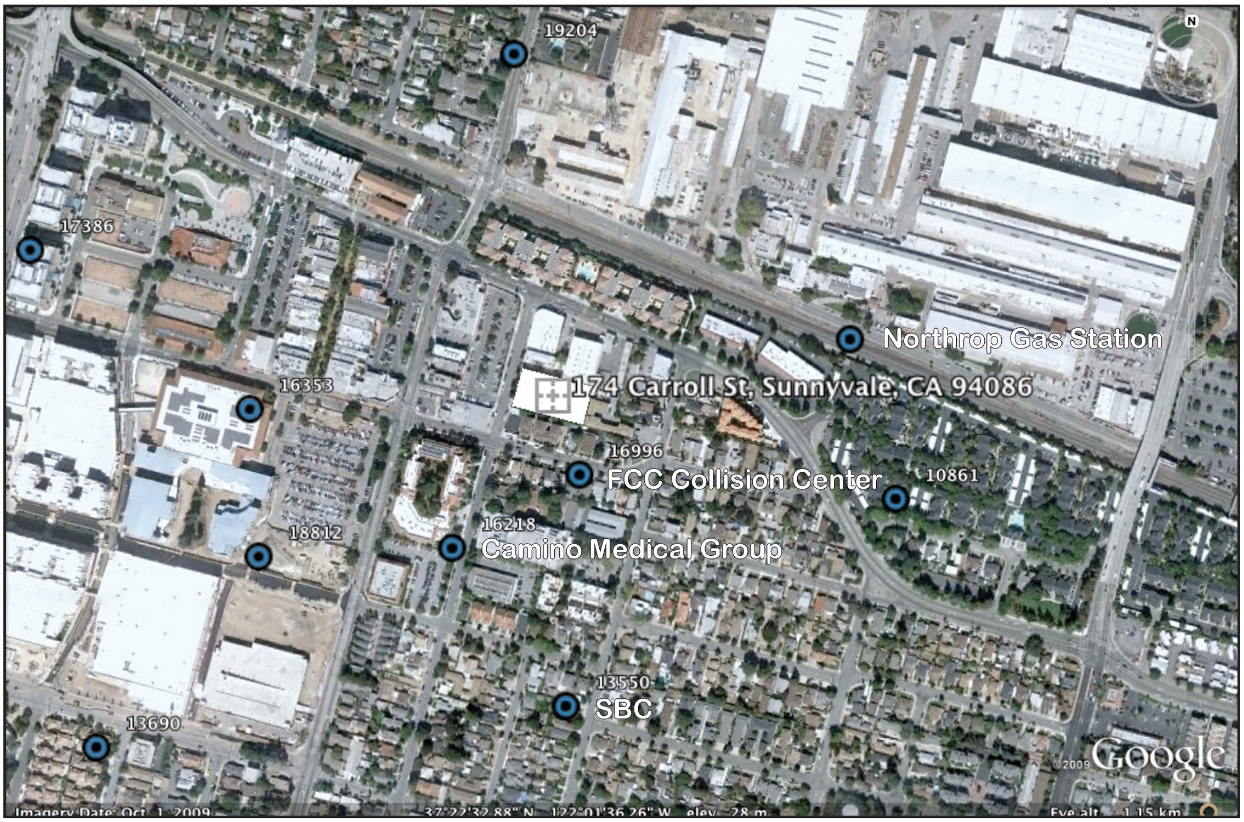
Traffic volume figures were found at www.ehib.org/traffic_tool.jsp
Stationary source and road/highway data were found at www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Tools-and-Methodology.aspx
Images we taken from both ehib.org and from the Google Earth application. Images and BAAQMD data accessed 12/16/10.

Email evelyn@nonprofithousing.org for a copy of the TAC Initial Screening Instructions packet, which includes links to all sources.

174 Carrol Street Sunnyvale

- Some of the nation’s most successful business and industrial leaders are located in Sunnyvale, including AMD, Network Appliance and Yahoo!
- Sunnyvale is a suburb that enjoys high-quality city services, a low crime rate, quality schools and prize-winning parks.
- This site is a housing element site, chosen by the city council to accommodate affordable housing.
- The Sunnyvale Caltrain Station is less than a quarter mile away.
- In the 1999-2006 housing element cycle, Sunnyvale permitted only a small fraction of the affordable housing the community needed:

Very Low			Low			Moderate			Above Moderate		
RHNA Allocation	Permits Issued	Percent of Allocation	RHNA Allocation	Permits Issued	Percent of Allocation	RHNA Allocation	Permits Issued	Percent of Allocation	RHNA Allocation	Permits Issued	Percent of Allocation
736	55	7%	361	57	16%	1075	194	18%	1664	1861	112%



Screening Table- Stationary Sources

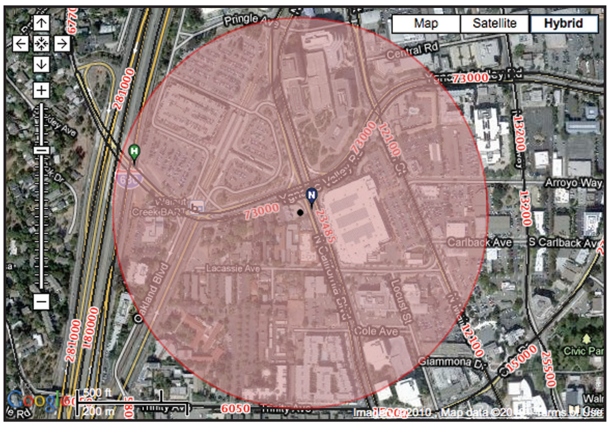
Source Name	Source Type	Cancer Risk (10)	Chronic Hazard Index (1)	Acute Hazard Index (1)	PM 2.5 Levels (.3)
Camino Medical Group	Emergency Standby Diesel Generator	4.87	.00173	0	.00867
FCC Collision Center	Spray Booth	2	.00196	.000142	.0181
Northrop Gas Station	Gas Dispensing Facility	.019591	.000018	.000005	0
SBC	Emergency IC Engine Generator	37.4	.0133	0	.0666
Totals		**44.289591**	**.017008**	**.000147**	**.09337**
Cumulative Threshold		**100**	**10**	**N/A**	**0.8**

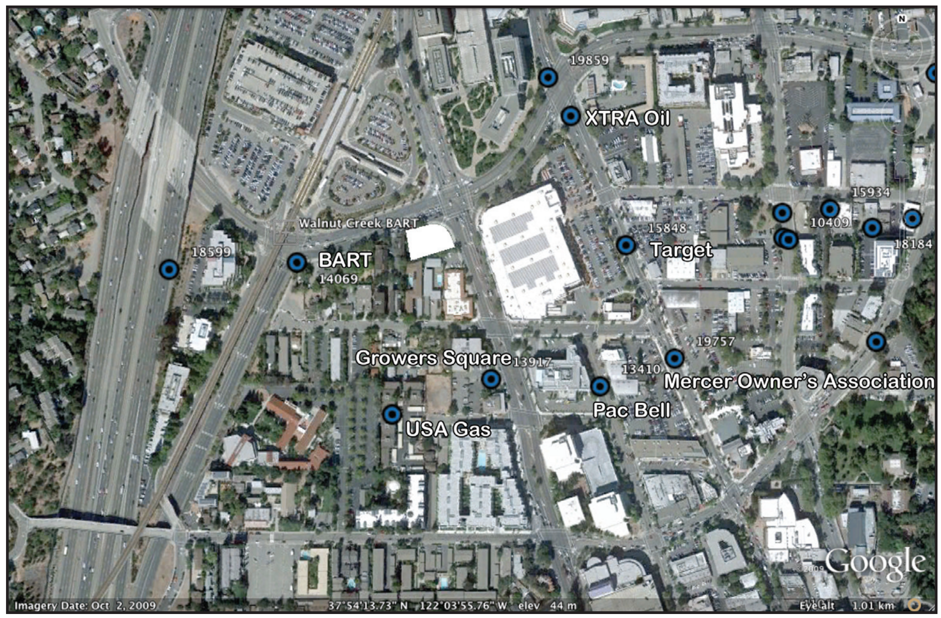
(#)- indicates individual threshold

265 Ygnacio Valley Road Walnut Creek

- Walnut Creek school district has some of the highest rated schools in the East Bay.
- With a thriving shopping district, Walnut Creek attracts sales tax dollars from residents throughout the East Bay.
- Some major employers include Kaiser Permanente, John Muir Hospital, and PMI Group.
- This site is located adjacent to the BART station and also serves as a bus stop with access to Bishop Ranch Business Park, Rossmoor Retirement Community, the two major hospitals, and a free bus downtown.
- This site is within half a mile of a park, a school, and the public library.
- In the 1999-2006 housing element cycle, Walnut Creek permitted less than half of the affordable housing the community needed:

Very Low			Low			Moderate			Above Moderate		
RHNA Allocation	Permits Issued	Percent of Allocation	RHNA Allocation	Permits Issued	Percent of Allocation	RHNA Allocation	Permits Issued	Percent of Allocation	RHNA Allocation	Permits Issued	Percent of Allocation
289	99	34%	195	80	41%	418	175	42%	751	1123	150%





Screening Table- Stationary and Road/Highway Sources

Source Name	Source Type	Cancer Risk (10)	Chronic Hazard Index (1)	Acute Hazard Index (1)	PM 2.5 Levels (.3)
SF BART District	Diesel Engine	49.5	0.0176	0	0.0881
USA Gas	Gas dispensing facility	3.315427	0.002998	0.000773	0
Growers Square	Diesel Engine, emergency stand	7.31	0.0026	0	0.013
Pacific Bell Corp	Emergency IC Engine	12.1	0.00431	0	0.0217
Target Corporation	Emergency Generator	0.0116	0.00008	0.000129	0.000509
Mercer Owners Association	Emergency Standby Diesel Generator	8.18	0.00291	0	0.0147
Xtra Oil Company	Gas dispensing facility	4.325125	0.003911	0.001008	0
HWY 680, 850ft	Highway	73	0	0	0.31
Road- Ygnacio Valley Rd.	Local Road	57	0.36	0.5	0.75
Road- N. California	Local Road	17	0.12	0.16	0.13
Road- N. Main Street	Local Road	0.036	0	0	0.015
Road- Trinity	Local Road	0.022	0	0	0.0087
Totals		**231.800152**	**0.514409**	**0.66191**	**1.351709**
Cumulative Threshold		**100**	**10**	**N/A**	**.8**

(#)- indicates individual threshold
**- Some figures approximated*

January 5, 2011

Planning Division
City of Pittsburg
65 Civic Avenue
Pittsburg, CA 94565

RE: Pittsburg/Bay Point BART Master Plan Draft EIR

Dear Planning Division:

I want to congratulate the City of Pittsburg for developing a master plan that encourages transit-oriented development and mixed-use zoning around the Pittsburg/Bay Point BART Station.

The current plan is a good start, but more can be done to ensure that a vibrant, pedestrian-friendly neighborhood will come from this Master Plan. My comments and suggestions are regarding the traffic circulation and mixed use/high-density housing component of the plan.

Traffic Circulation
Currently, the conceptual site plan does not do enough to integrate existing and future communities in the area. Although part of the Master Plan area is located on land owned by West Coast Home Builders (WCHB) and the other portion is on land owned by BART, the City of Pittsburg should encourage connectivity and integration between existing and future neighborhoods as much as possible.

Connectivity should be maximized by using a traditional street-grid pattern in the undeveloped (WCHB) land and BART parking lot. **Cul-de-sacs and street loops should be discouraged**. A street-grid allows pedestrians and bicyclists to move freely and gives them more options to head towards their destination. This also avoids concentrating all vehicular traffic onto West Leland Road.

Another suggestion to better integrate current and future neighborhoods would be to redesign the street pattern. If possible, align planned/future streets with existing streets in the neighborhood located south of BART and coordinate streets plans with future neighborhoods that will be located west of BART. In the conceptual site plan, Oak Hills Road connects to the Master Plan area, but Southwood Drive and Woodhill Drive do not. Improving street connectivity would improve circulation and minimize the amount of traffic signals along West Leland Road.

Mixed-Use/High-Density Housing
The Plan should increase the amount of mixed-use/ground floor retail zoning and increase high-density housing zoning on the BART property portion of the Master Plan. This includes having more retail, restaurant and/or office space below the medium- and high-density residential areas. This is a unique opportunity for the City of Pittsburg to increase tax revenue by creating a neighborhood “downtown” or retail destination for the western part of Pittsburg and Bay Point.

This suggestion is not meant to undermine the current plans for Old Town Pittsburg but to capitalize on an existing population base on the west side of Pittsburg and the adjacent community of Bay Point that go to Concord and other central Contra Costa County cities to shop.

These suggestions will have multiple positive effects on the area. It will encourage more pedestrians and bicyclists, integrate existing communities and provide more access points for emergency services. Please make high-density housing and street design a top priority to ensure this neighborhood is vibrant and sustainable in the future.

Sincerely,

Jonathan Mendoza
Resident of Pittsburg

Department of Conservation & Development

Community Development Division

County Administration Building
651 Pine Street
North Wing, Fourth Floor
Martinez, CA 94553-1229

Phone: (925) 335-1220

Contra Costa County

Catherine O. Kutsuris
Director

Aruna Bhat
Deputy Director
Community Development Division

January 6, 2011

Leigha Schmidt, Project Planner
City of Pittsburg, Planning Division
65 Civic Avenue
Pittsburg, CA 94565

RE: Comments on Pittsburg/Bay Point BART Master Plan and Initial Study. Lead Agency: City of Pittsburg

Dear Ms. Schmidt:

Thank you for providing the Department of Conservation and Development, Contra Costa County an opportunity to comment on the above captioned project. After reviewing the environmental document, the Transportation Planning Section would like to provide the following comments on the *Transportation and Circulation* section and analysis presented in the Initial Study:

1. State Route 4, Bailey Road, and W. Leland Road are designated Routes of Regional Significance in the East County Action Plan. Impacts to these routes should be evaluated in subsequent environmental analyses in the context of the Action Plan. This includes evaluation of project impacts on applicable Multi-Modal Transportation Service Objectives (MTSO). The EIR should apply the Transportation Authority's travel demand model and technical procedures to the project analysis.

2. If not already a part of the analysis, the evaluation of project impacts should include the section of Bailey Road south of the Pittsburg city limit and the Bailey Road/Willow Pass Road intersection. Willow Pass Road is also a designated route of regional significance in the Action Plan.

3. The Initial Study indicates the possibility of a "flex" land use designation, which could be "residential, retail, office, or what the market dictates" at final build-out. Given the number of alternative land uses that could occur, the EIR's traffic analysis should at the least evaluate all three possibilities, and mitigate the worst case scenario.

4. Figure 3 does not show a connection to East Bay Park's Delta DeAnza Regional Trail. The County's Bailey Road Bicycle Pedestrian Improvement Plan identified ultimate improvements for this regional trail facility, which would be the major bike/ped access to the BART station area for Bay Point residents. The Delta DeAnza Trail crosses Bailey Road at the eastbound State Route 4 off-ramp. The EIR should evaluate the adequacy of the project's ped/bike path connections to this regional trail facility.

5. The County General Plan has the bike lanes on Bailey Road designated as Class II facilities. The bike lane class designation should be noted on future plans.

6. The EIR's traffic analysis should also consider the following adopted County plans: the Pittsburg-Bay Point BART Station Area Specific Plan (June 2002), Bailey Road Bicycle and Pedestrian Improvement Plan, May 2010, and the Bay Point Community-Based Transportation Plan, January 2007. These documents can be found at www.cocoplans.org.

7. The EIR should also consider the Concord Naval Weapons Station Reuse project in the cumulative analysis. Significant increases in demand at this transit center would be expected to occur – along with increased traffic demand on the SR-4 and other major roads and intersections in the vicinity – as a result of the reuse project.

The **Contra Costa County Public Works Department** has the following comments based on their review of the Pittsburg/Bay Point BART Master Plan and Initial Study dated December 2010.

8. The EIR should address traffic impacts during the various phases of construction. The area already experiences challenges related to parking and congestion. The phasing plan should describe how the temporary construction impacts will be mitigated and assure that supporting infrastructure is provided prior to each phase of development so that the existing congestion is not exacerbated. For example, a building site that is anticipated to generate trips to the area should be preceded by the accompanying parking and circulation elements required to keep level of service at adequate levels, Or if a building will replace existing parking, the temporary loss in parking should be mitigated. This will ease the impacts to the surrounding neighborhoods adjacent to the new transit village.

9. The document should explain the relationship between the Pittsburg BART expansion and the e-BART project. Will Pittsburg be the future transfer station for e-bart? How does this Master Plan accommodate future changes in the system related to e-BART.

10. The traffic analysis for the project should incorporate trip generation from ultimate development to include additional truck trips related to the proposed expansion of the

Keller Canyon Landfill and redevelopment of the Orbisonia Heights Multi-use area along Bailey Road east of the BART station.

11. The circulation plan for the Transit Village should clarify routes for pedestrians, bicycles, busses and vehicular traffic, acknowledging that separation of pedestrian and vehicles is preferred for safety and efficiency.

12. The proposed Bailey Road Pedestrian and Bicycle Improvement Plan include major infrastructure changes at the interchange, including elimination of two on/off ramps. The traffic analysis should include the existing interchange configuration and an alternative that reflects completion of the Bailey Road Bicycle and Pedestrian Improvement Plan.

If you have any questions or concerns regarding the above comments, please do not hesitate to contact me at the above telephone number, or e-mail me at jamar.stamps@dcd.cccounty.us. Again, thank you for the opportunity to respond to the Initial Study. The County looks forward to being involved in the review of Draft EIR for the proposed project.

Sincerely,

Jamar Stamps
Transportation Planning Section

cc: S. Goetz, DCD
P. Roche, DCD
J. Greitzer, DCD
M. Carlson, PWD
M. Halle, PWD
J. Cunningham, TRANSPLAN

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY Edmund G. Brown Jr., Governor

DEPARTMENT OF TRANSPORTATION
111 GRAND AVENUE
P. O. BOX 23660
OAKLAND, CA 94623-0660
PHONE (510) 622-5491
FAX (510) 286-5559
TTY 711

*Flex your power!
Be energy efficient!*

January 7, 2011

CC004062
CC-4-R20.10
SCH #2010122023

Ms. Leigha Schmidt
City of Pittsburg
Planning Division
65 Civic Avenue
Pittsburg, CA 94565

Dear Ms. Schmidt:

Pittsburg/Bay Point BART Master Plan – Notice of Preparation (NOP)

Thank you for including the California Department of Transportation (Department) in the environmental review process for the Pittsburg/Bay Point BART Master Plan project. The following comments are based on the NOP. As the lead agency, the City of Pittsburg is responsible for all project mitigation, including any needed improvements to state highways. The project's fair share contribution, financing, scheduling, implementation responsibilities and lead agency monitoring should be fully discussed for all proposed mitigation measures. This information should also be presented in the Mitigation Monitoring and Reporting Plan of the environmental document. Required roadway improvements should be completed prior to issuance of the Certificate of Occupancy. Since an encroachment permit is required for work in the State right of way (ROW), and the Department will not issue a permit until our concerns are adequately addressed, we strongly recommend that the City of Pittsburg work with both the applicant and the Department to ensure that our concerns are resolved during the California Environmental Quality Act (CEQA) process, and in any case prior to submittal of a permit application. Further comments will be provided during the encroachment permit process; see the end of this letter for more information regarding encroachment permits.

Community Planning
The proposed Pittsburg/Bay Point BART Master Plan Project has the potential to significantly impact State Route 4; therefore, the Department encourages the City to initiate Transportation Demand Management measures such as offering a universal transit pass program to employees and residents at the project sight.

Traffic Impact Study (TIS)
Please include the information detailed below in the TIS to ensure that project-related impacts to State roadway facilities are thoroughly assessed. We encourage the City of Pittsburg to coordinate preparation of the study with our office, and we would appreciate the opportunity to review the scope of work. The Department's *"Guide for the Preparation of Traffic Impact Studies"* should be reviewed prior to initiating any traffic analysis for the project; it is available at the following website:
http://www.dot.ca.gov/hq/traffops/developserv/operationalsystems/reports/tisguide.pdf
The TIS should include:

1. Vicinity map, regional location map, and a site plan clearly showing project access in relation to nearby State roadways. Ingress and egress for all project components should be clearly identified. State ROW should be clearly identified.

2. The maps should also include project driveways, local roads and intersections, parking, and transit facilities.

3. Project-related trip generation, distribution, and assignment. The assumptions and methodologies used to develop this information should be detailed in the study, and should be supported with appropriate documentation.

4. Average Daily Traffic, AM and PM peak hour volumes and levels of service (LOS) on all significantly affected roadways, including crossroads and controlled intersections for existing, existing plus project, cumulative and cumulative plus project scenarios. Calculation of cumulative traffic volumes should consider all traffic-generating developments, both existing and future, that would affect study area roadways and intersections. *The analysis should clearly identify the project's contribution to area traffic and degradation to existing and cumulative levels of service. Lastly, the Department's LOS threshold, which is the transition between LOS C and D, and is explained in detail in the Guide for Traffic Studies, should be applied to all State facilities.*

5. Schematic illustration of traffic conditions including the project site and study area roadways, trip distribution percentages and volumes as well as intersection geometrics, i.e., lane configurations, for the scenarios described above.

6. The project's consistency with both the Circulation Element of the General Plan and the Contra Costa County Congestion Management Agency's Congestion Management Plan should be evaluated.

7. Mitigation should be identified for any roadway mainline section or intersection with insufficient capacity to maintain an acceptable LOS with the addition of project-related and/or cumulative traffic.

8. Special attention should be given to the following trip-reducing measures:
   - Coordinating with transit providers, to increase transit use by expanding routes and emphasizing express service to regional rail stations, and by providing bus shelters with seating at any future bus pullouts,

- Providing transit information to all future residents, employers, and employees, and
- Encouraging bicycle- and pedestrian-friendly design.

Please forward three hard copies and one CD of the environmental document, along with the TIS, including Technical Appendices, and staff report to the address below as soon as they are available.

Luis Melendez
Community Planning Office, Mail Station 10D
California DOT, District 4
P.O. Box 23660
Oakland, CA 94623-0660

Encroachment Permit
Please be advised that any work or traffic control that encroaches onto the State ROW requires an encroachment permit that is issued by the Department. To apply, a completed encroachment permit application, environmental documentation, and five (5) sets of plans clearly indicating State ROW must be submitted to the following address:

Michael Condie, District Office Chief
Office of Permits
California DOT, District 4
P.O. Box 23660
Oakland, CA 94623-0660

Traffic-related mitigation measures should be incorporated into the construction plans during the encroachment permit process. See the website link below for more information.
http://www.dot.ca.gov/hq/traffops/developserv/permits/

Please feel free to call or email Luis Melendez of my staff at (510) 286-5606 or Luis_Melendez@dot.ca.gov with any questions regarding this letter.

Sincerely,

Lisa Carboni

LISA CARBONI
District Branch Chief
Local Development – Intergovernmental Review

c: State Clearinghouse

APPENDIX C: TRANSPORTATION TECHNICAL APPENDIX

Pittsburg/Bay Point BART Master Plan
Draft EIR

Transportation Technical Appendix

March 2011

FEHR PEERS

APPENDIX A:
EXISTING VEHICLE COUNTS

All Traffic Data

(916) 771-8700

PITTSBURG

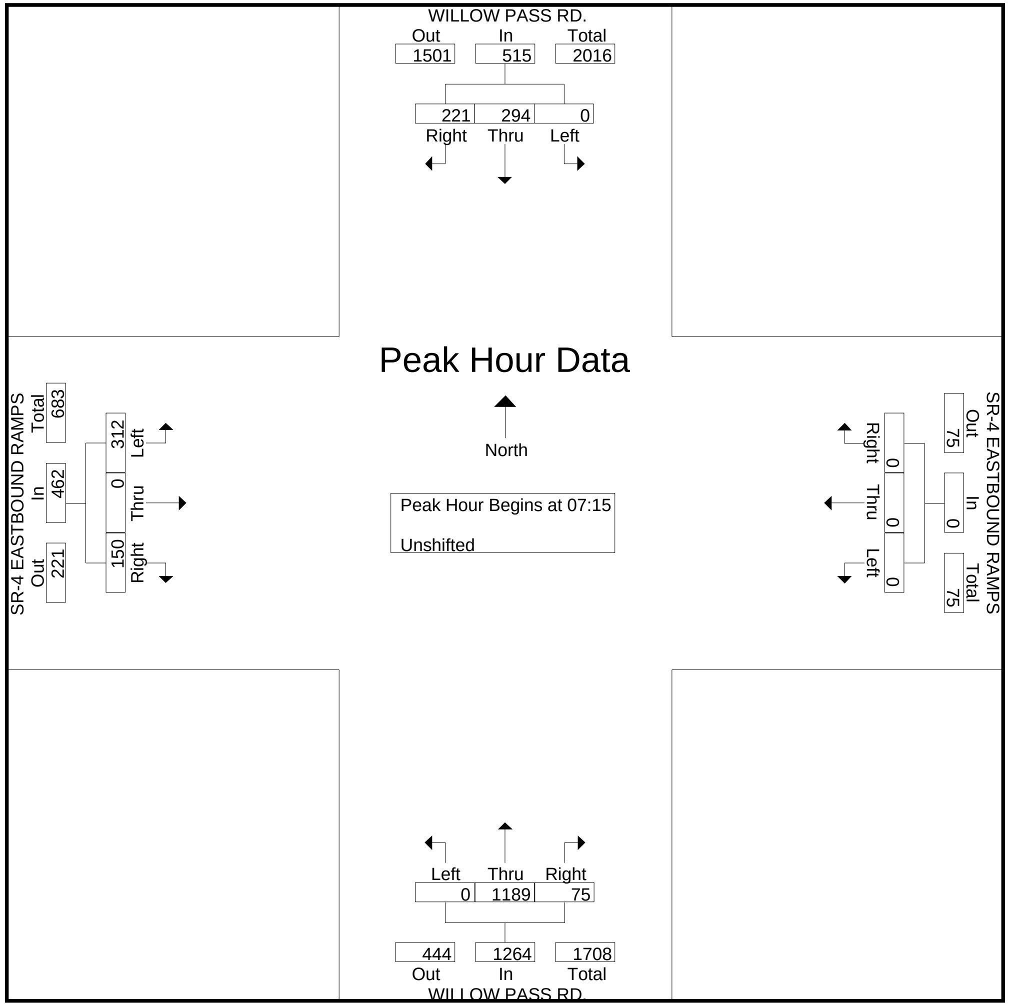
File Name : 10-7481-002 WILLOW PASS-EB RAMPS
Site Code : 00000000
Start Date : 11/17/2010
Page No : 1

Groups Printed- Unshifted

	WILLOW PASS RD. Southbound				SR-4 EASTBOUND RAMPS Westbound				WILLOW PASS RD. Northbound				SR-4 EASTBOUND RAMPS Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	0	29	36	65	0	0	0	0	0	277	10	287	63	0	30	93	445
07:15	0	57	40	97	0	0	0	0	0	302	14	316	52	0	31	83	496
07:30	0	93	68	161	0	0	0	0	0	371	14	385	61	0	30	91	637
07:45	0	105	62	167	0	0	0	0	0	306	22	328	105	0	38	143	638
Total	0	284	206	490	0	0	0	0	0	1256	60	1316	281	0	129	410	2216
08:00	0	39	51	90	0	0	0	0	0	210	25	235	94	0	51	145	470
08:15	0	22	42	64	0	0	0	0	0	127	19	146	69	0	24	93	303
08:30	0	33	47	80	0	0	0	0	0	116	16	132	64	0	25	89	301
08:45	0	31	52	83	0	0	0	0	0	112	11	123	44	0	17	61	267
Total	0	125	192	317	0	0	0	0	0	565	71	636	271	0	117	388	1341
16:00	0	36	24	60	0	0	0	0	0	77	1	78	191	0	95	286	424
16:15	0	39	31	70	0	0	0	0	0	65	5	70	215	0	110	325	465
16:30	0	44	34	78	0	0	0	0	0	74	7	81	240	0	127	367	526
16:45	0	43	21	64	0	0	0	0	0	86	5	91	228	0	121	349	504
Total	0	162	110	272	0	0	0	0	0	302	18	320	874	0	453	1327	1919
17:00	0	39	21	60	0	0	0	0	0	94	3	97	242	0	153	395	552
17:15	0	55	31	86	0	0	0	0	0	83	5	88	231	0	146	377	551
17:30	0	65	28	93	0	0	0	0	0	112	8	120	199	0	157	356	569
17:45	0	50	29	79	0	0	0	0	0	82	10	92	198	0	155	353	524
Total	0	209	109	318	0	0	0	0	0	371	26	397	870	0	611	1481	2196
Grand Total	0	780	617	1397	0	0	0	0	0	2494	175	2669	2296	0	1310	3606	7672
Apprch %	0	55.8	44.2		0	0	0		0	93.4	6.6		63.7	0	36.3		
Total %	0	10.2	8	18.2	0	0	0	0	0	32.5	2.3	34.8	29.9	0	17.1	47	

	WILLOW PASS RD. Southbound				SR-4 EASTBOUND RAMPS Westbound				WILLOW PASS RD. Northbound				SR-4 EASTBOUND RAMPS Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15																	
07:15	0	57	40	97	0	0	0	0	0	302	14	316	52	0	31	83	496
07:30	0	93	**68**	161	0	0	0	0	0	**371**	14	**385**	61	0	30	91	637
07:45	0	**105**	62	**167**	0	0	0	0	0	306	22	328	**105**	0	38	143	**638**
08:00	0	39	51	90	0	0	0	0	0	210	**25**	235	94	0	**51**	**145**	470
Total Volume	0	294	221	515	0	0	0	0	0	1189	75	1264	312	0	150	462	2241

PHF	.000	.700	.813	.771	.000	.000	.000	.000	.000	.801	.750	.821	.743	.000	.735	.797	.878



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

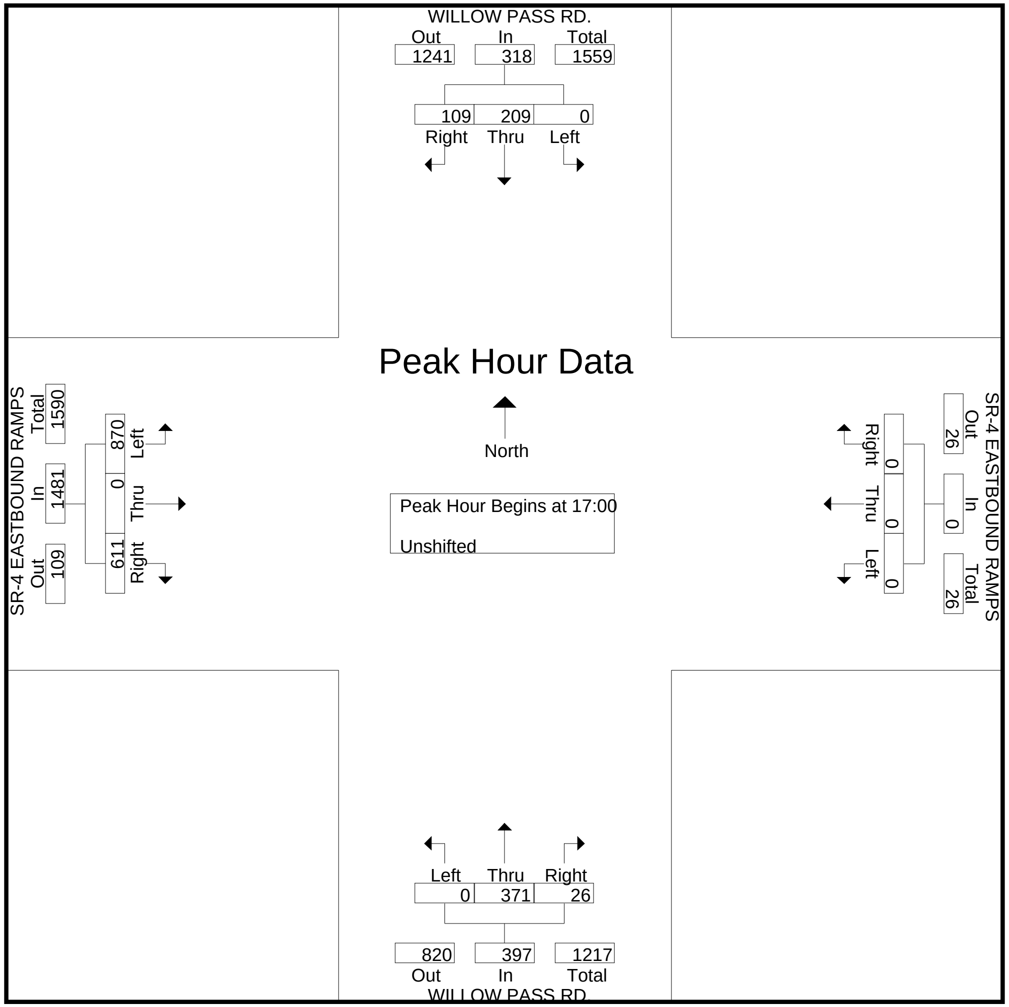
17:00	0	39	21	60	0	0	0	0	0	94	3	97	**242**	0	153	**395**	552
17:15	0	55	**31**	86	0	0	0	0	0	83	5	88	231	0	146	377	551
17:30	0	**65**	28	**93**	0	0	0	0	0	**112**	8	**120**	199	0	**157**	356	**569**
17:45	0	50	29	79	0	0	0	0	0	82	**10**	92	198	0	155	353	524
Total Volume	0	209	109	318	0	0	0	0	0	371	26	397	870	0	611	1481	2196
% App. Total	0	65.7	34.3		0	0	0		0	93.5	6.5		58.7	0	41.3		
PHF	.000	.804	.879	.855	.000	.000	.000	.000	.000	.828	.650	.827	.899	.000	.973	.937	.965

All Traffic Data

(916) 771-8700

PITTSBURG

File Name : 10-7481-002 WILLOW PASS-EB RAMPS
Site Code : 00000000
Start Date : 11/17/2010
Page No : 3



All Traffic Data

(916) 771-8700

PITTSBURG

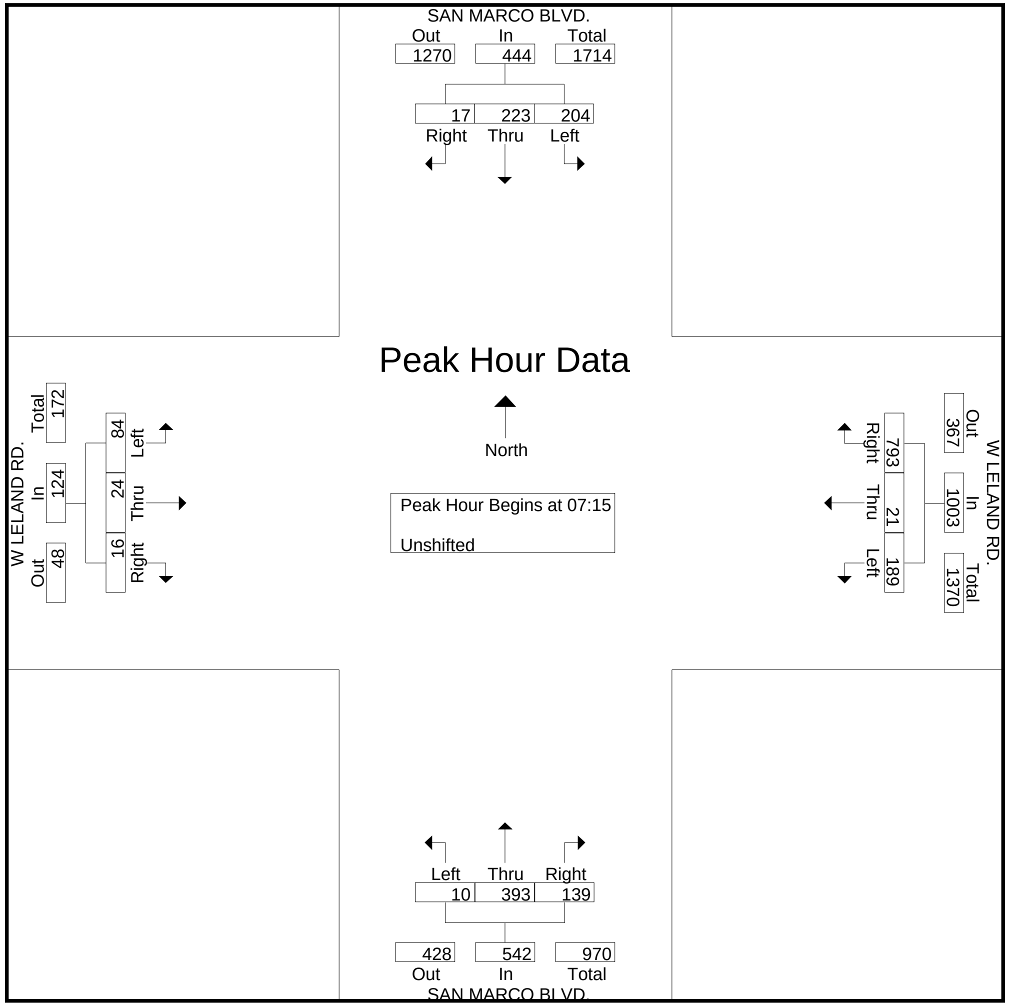
File Name : 10-7481-003 SAN MARCO-LELAND
Site Code : 00000000
Start Date : 11/17/2010
Page No : 1

Groups Printed- Unshifted

	SAN MARCO BLVD. Southbound				W LELAND RD. Westbound				SAN MARCO BLVD. Northbound				W LELAND RD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	31	25	3	59	20	4	205	229	0	54	12	66	18	1	0	19	373
07:15	48	30	5	83	15	7	226	248	0	71	15	86	27	11	2	40	457
07:30	48	77	3	128	83	2	247	332	0	102	24	126	26	3	4	33	619
07:45	44	94	4	142	85	6	192	283	6	127	51	184	18	6	8	32	641
Total	171	226	15	412	203	19	870	1092	6	354	102	462	89	21	14	124	2090
08:00	64	22	5	91	6	6	128	140	4	93	49	146	13	4	2	19	396
08:15	23	22	3	48	10	0	90	100	0	38	13	51	15	3	0	18	217
08:30	35	24	3	62	4	3	83	90	1	43	17	61	10	2	0	12	225
08:45	28	12	3	43	9	1	76	86	0	33	6	39	9	1	1	11	179
Total	150	80	14	244	29	10	377	416	5	207	85	297	47	10	3	60	1017
16:00	87	27	8	122	9	2	46	57	1	24	10	35	3	1	0	4	218
16:15	115	31	9	155	8	3	45	56	0	24	7	31	7	1	1	9	251
16:30	116	33	18	167	17	3	51	71	0	20	14	34	5	4	0	9	281
16:45	123	40	5	168	13	4	63	80	1	19	18	38	6	0	1	7	293
Total	441	131	40	612	47	12	205	264	2	87	49	138	21	6	2	29	1043
17:00	127	47	15	189	16	3	57	76	0	29	17	46	10	5	0	15	326
17:15	136	55	14	205	20	6	58	84	0	26	10	36	4	3	1	8	333
17:30	148	63	9	220	13	3	60	76	2	49	26	77	8	5	0	13	386
17:45	136	48	22	206	18	10	58	86	0	29	18	47	8	9	1	18	357
Total	547	213	60	820	67	22	233	322	2	133	71	206	30	22	2	54	1402
Grand Total	1309	650	129	2088	346	63	1685	2094	15	781	307	1103	187	59	21	267	5552
Apprch %	62.7	31.1	6.2		16.5	3	80.5		1.4	70.8	27.8		70	22.1	7.9		
Total %	23.6	11.7	2.3	37.6	6.2	1.1	30.3	37.7	0.3	14.1	5.5	19.9	3.4	1.1	0.4	4.8	

	SAN MARCO BLVD. Southbound				W LELAND RD. Westbound				SAN MARCO BLVD. Northbound				W LELAND RD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15																	
07:15	48	30	**5**	83	15	**7**	226	248	0	71	15	86	**27**	**11**	2	**40**	457
07:30	48	77	3	128	83	2	**247**	**332**	0	102	24	126	26	3	4	33	619
07:45	44	**94**	4	**142**	**85**	6	192	283	**6**	**127**	**51**	**184**	18	6	**8**	32	**641**
08:00	**64**	22	5	91	6	6	128	140	4	93	49	146	13	4	2	19	396
Total Volume	204	223	17	444	189	21	793	1003	10	393	139	542	84	24	16	124	2113

PHF	.797	.593	.850	.782	.556	.750	.803	.755	.417	.774	.681	.736	.778	.545	.500	.775	.824



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

17:00	127	47	15	189	16	3	57	76	0	29	17	46	**10**	5	0	15	326
17:15	136	55	14	205	**20**	6	58	84	0	26	10	36	4	3	**1**	8	333
17:30	**148**	**63**	9	**220**	13	3	**60**	76	**2**	**49**	**26**	**77**	8	5	0	13	**386**
17:45	136	48	**22**	206	18	**10**	58	**86**	0	29	18	47	8	**9**	1	**18**	357
Total Volume	547	213	60	820	67	22	233	322	2	133	71	206	30	22	2	54	1402
% App. Total	66.7	26	7.3		20.8	6.8	72.4		1	64.6	34.5		55.6	40.7	3.7		
PHF	.924	.845	.682	.932	.838	.550	.971	.936	.250	.679	.683	.669	.750	.611	.500	.750	.908

All Traffic Data

(916) 771-8700

PITTSBURG

File Name : 10-7481-003 SAN MARCO-LELAND
Site Code : 00000000
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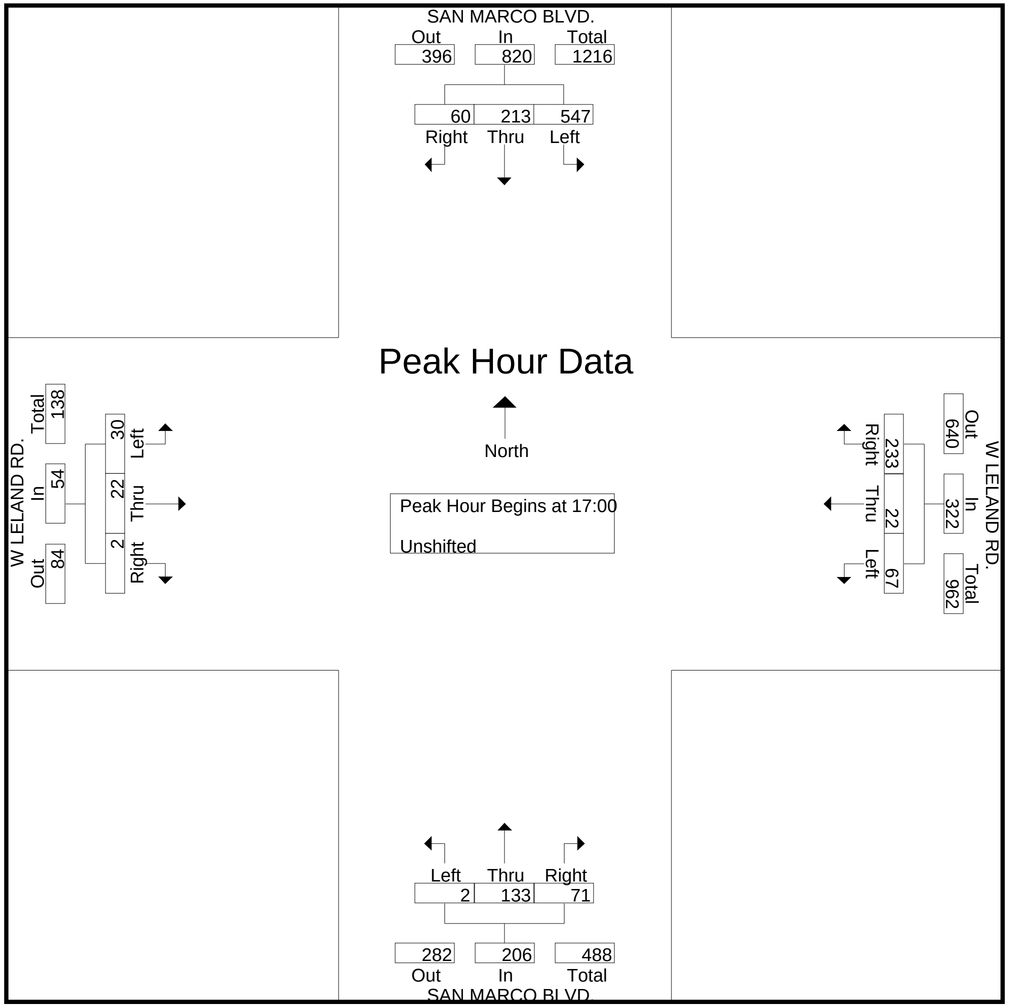


All Traffic Data

(916) 771-8700

PITTSBURG

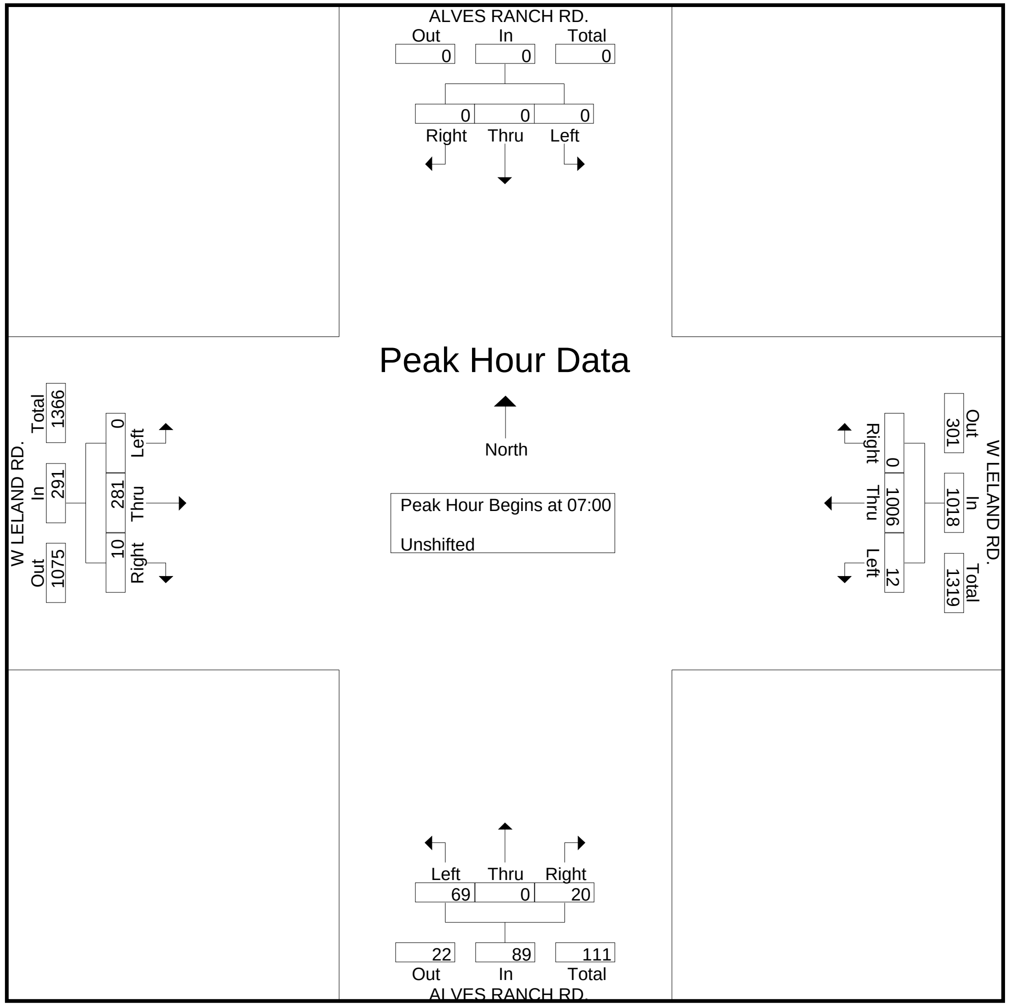
File Name : 10-7481-004 ALVES RANCH-LELAND
Site Code : 00000000
Start Date : 11/17/2010
Page No : 1

Groups Printed- Unshifted

	ALVES RANCH RD. Southbound				W LELAND RD. Westbound				ALVES RANCH RD. Northbound				W LELAND RD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	0	0	0	0	5	215	0	220	15	0	5	20	0	42	0	42	282
07:15	0	0	0	0	5	227	0	232	19	0	8	27	0	64	4	68	327
07:30	0	0	0	0	2	329	0	331	21	0	5	26	0	79	2	81	438
07:45	0	0	0	0	0	235	0	235	14	0	2	16	0	96	4	100	351
Total	0	0	0	0	12	1006	0	1018	69	0	20	89	0	281	10	291	1398
08:00	0	0	0	0	3	124	0	127	10	0	5	15	1	103	6	110	252
08:15	0	0	0	0	3	97	0	100	3	0	5	8	0	42	1	43	151
08:30	0	0	0	0	7	76	0	83	12	0	5	17	0	46	6	52	152
08:45	0	0	0	0	3	73	0	76	5	0	5	10	0	32	3	35	121
Total	0	0	0	0	16	370	0	386	30	0	20	50	1	223	16	240	676
16:00	0	0	0	0	3	51	0	54	4	0	7	11	0	93	5	98	163
16:15	0	0	0	0	7	46	0	53	8	0	5	13	0	117	5	122	188
16:30	0	0	0	0	7	72	1	80	3	0	8	11	0	121	8	129	220
16:45	0	0	1	1	3	73	1	77	4	0	4	8	0	131	5	136	222
Total	0	0	1	1	20	242	2	264	19	0	24	43	0	462	23	485	793
17:00	0	0	0	0	7	72	0	79	4	0	4	8	0	142	3	145	232
17:15	0	0	0	0	6	78	0	84	4	0	10	14	0	144	8	152	250
17:30	0	0	0	0	4	68	0	72	2	0	5	7	0	156	5	161	240
17:45	0	0	0	0	7	77	0	84	6	0	3	9	0	167	8	175	268
Total	0	0	0	0	24	295	0	319	16	0	22	38	0	609	24	633	990
Grand Total	0	0	1	1	72	1913	2	1987	134	0	86	220	1	1575	73	1649	3857
Apprch %	0	0	100		3.6	96.3	0.1		60.9	0	39.1		0.1	95.5	4.4		
Total %	0	0	0	0	1.9	49.6	0.1	51.5	3.5	0	2.2	5.7	0	40.8	1.9	42.8	

	ALVES RANCH RD. Southbound				W LELAND RD. Westbound				ALVES RANCH RD. Northbound				W LELAND RD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	0	0	0	0	**5**	215	0	220	15	0	5	20	0	42	0	42	282
07:15	0	0	0	0	5	227	0	232	19	0	**8**	**27**	0	64	**4**	68	327
07:30	0	0	0	0	2	**329**	0	**331**	**21**	0	5	26	0	79	2	81	**438**
07:45	0	0	0	0	0	235	0	235	14	0	2	16	0	**96**	4	**100**	351

% App. Total	0	0	0		1.2	98.8	0		77.5	0	22.5		0	96.6	3.4		
PHF	.000	.000	.000	.000	.600	.764	.000	.769	.821	.000	.625	.824	.000	.732	.625	.728	.798



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

17:00	0	0	0	0	**7**	72	0	79	4	0	4	8	0	142	3	145	232
17:15	0	0	0	0	6	**78**	0	**84**	4	0	**10**	**14**	0	144	**8**	152	250
17:30	0	0	0	0	4	68	0	72	2	0	5	7	0	156	5	161	240
17:45	0	0	0	0	7	77	0	84	**6**	0	3	9	0	**167**	8	**175**	**268**
Total Volume	0	0	0	0	24	295	0	319	16	0	22	38	0	609	24	633	990
% App. Total	0	0	0		7.5	92.5	0		42.1	0	57.9		0	96.2	3.8		
PHF	.000	.000	.000	.000	.857	.946	.000	.949	.667	.000	.550	.679	.000	.912	.750	.904	.924

All Traffic Data

(916) 771-8700

PITTSBURG

File Name : 10-7481-004 ALVES RANCH-LELAND
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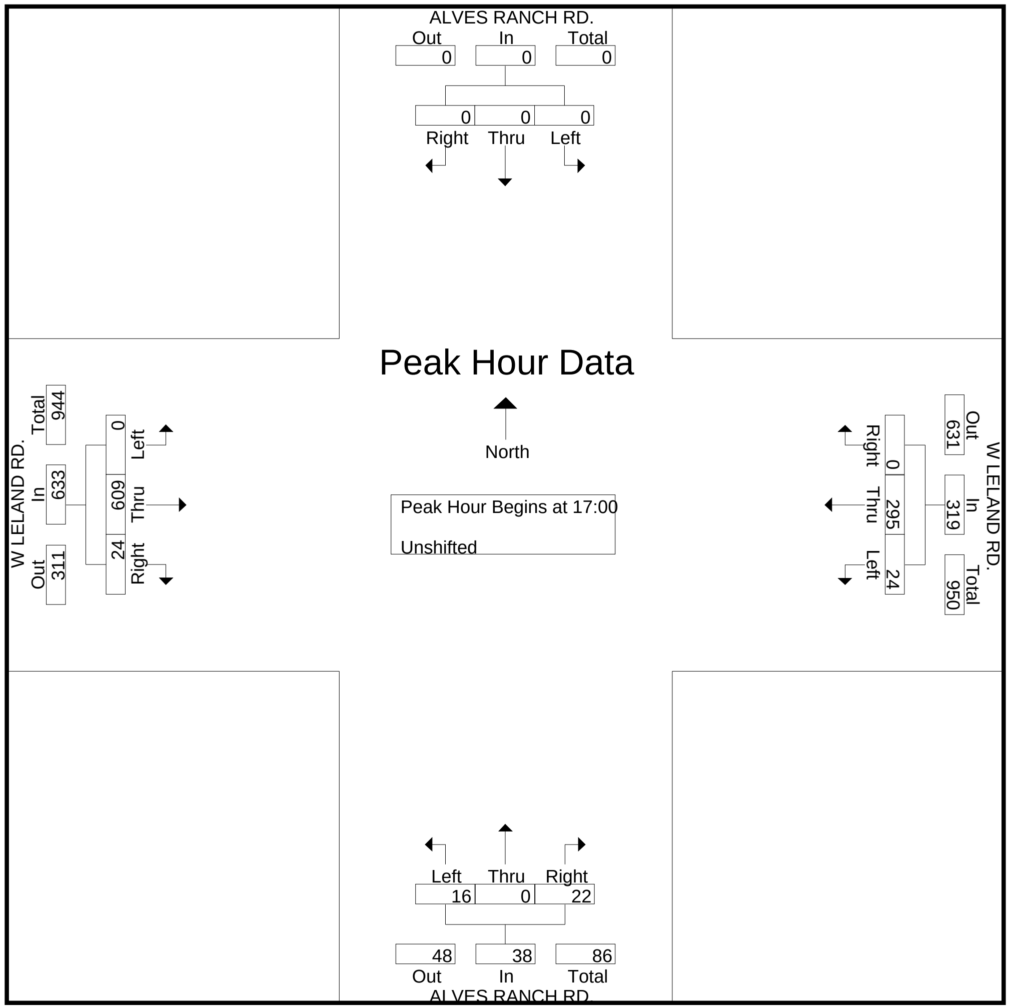


All Traffic Data

(916) 771-8700

PITTSBURG

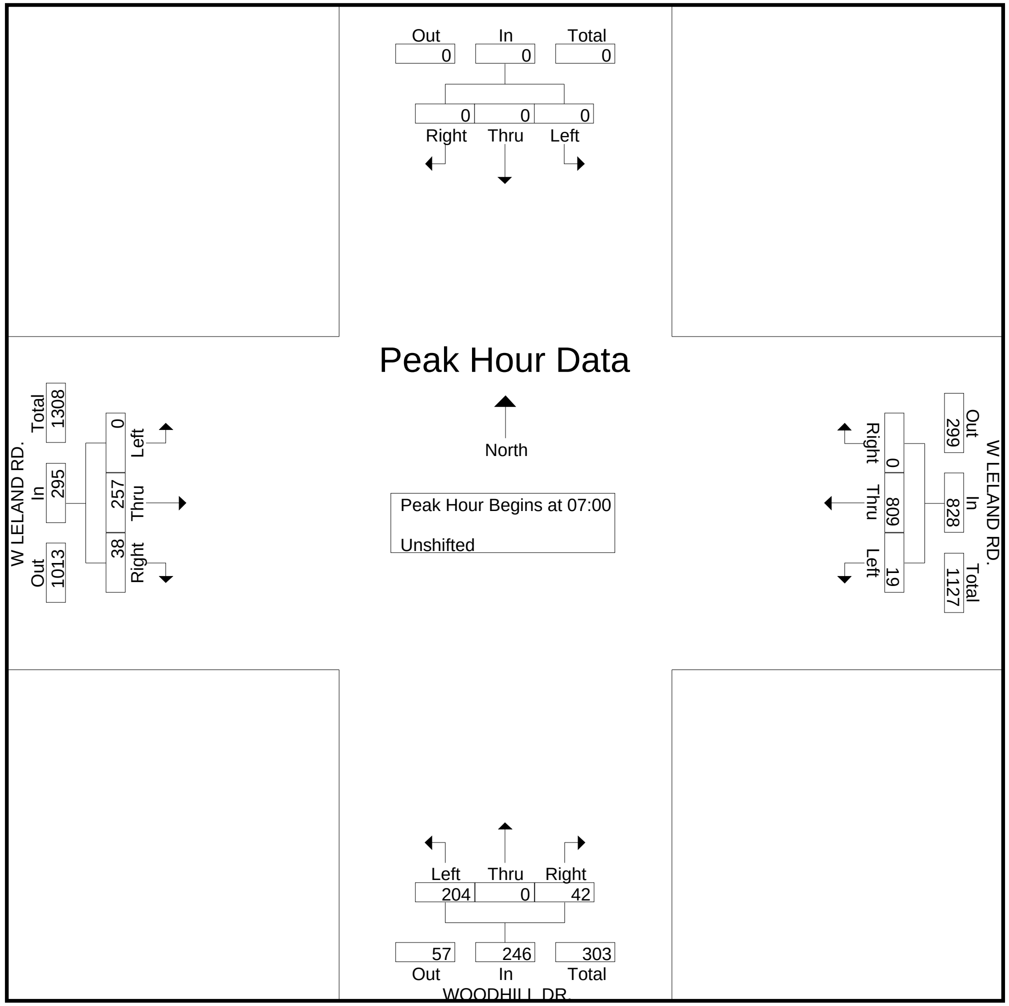
File Name : 10-7481-005 WOODHILL-LELAND
Site Code : 00000000
Start Date : 11/17/2010
Page No : 1

Groups Printed- Unshifted

	Southbound				W LELAND RD. Westbound				WOODHILL DR. Northbound				W LELAND RD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	0	0	0	0	4	168	0	172	57	0	5	62	0	38	8	46	280
07:15	0	0	0	0	4	205	0	209	46	0	13	59	0	64	6	70	338
07:30	0	0	0	0	6	252	0	258	71	0	11	82	0	74	8	82	422
07:45	0	0	0	0	5	184	0	189	30	0	13	43	0	81	16	97	329
Total	0	0	0	0	19	809	0	828	204	0	42	246	0	257	38	295	1369
08:00	0	0	0	0	5	115	0	120	17	0	5	22	0	88	27	115	257
08:15	0	0	0	0	8	82	0	90	13	0	8	21	0	31	8	39	150
08:30	0	0	0	0	6	66	0	72	18	0	13	31	0	51	5	56	159
08:45	0	0	0	0	4	51	0	55	25	0	6	31	0	33	3	36	122
Total	0	0	0	0	23	314	0	337	73	0	32	105	0	203	43	246	688
16:00	0	0	0	0	9	42	0	51	15	0	11	26	0	83	18	101	178
16:15	0	0	0	0	10	42	0	52	14	0	5	19	0	101	21	122	193
16:30	0	0	0	0	13	70	0	83	14	0	8	22	0	114	16	130	235
16:45	0	0	0	0	7	56	0	63	11	0	8	19	0	109	23	132	214
Total	0	0	0	0	39	210	0	249	54	0	32	86	0	407	78	485	820
17:00	0	0	0	0	9	67	0	76	16	0	4	20	0	119	28	147	243
17:15	0	0	0	0	5	80	0	85	8	0	4	12	0	126	30	156	253
17:30	0	0	0	0	6	59	0	65	8	0	6	14	0	136	19	155	234
17:45	0	0	0	0	12	76	0	88	10	0	6	16	0	144	30	174	278
Total	0	0	0	0	32	282	0	314	42	0	20	62	0	525	107	632	1008
Grand Total	0	0	0	0	113	1615	0	1728	373	0	126	499	0	1392	266	1658	3885
Apprch %	0	0	0		6.5	93.5	0		74.7	0	25.3		0	84	16		
Total %	0	0	0	0	2.9	41.6	0	44.5	9.6	0	3.2	12.8	0	35.8	6.8	42.7	

	Southbound				W LELAND RD. Westbound				WOODHILL DR. Northbound				W LELAND RD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	0	0	0	0	4	168	0	172	57	0	5	62	0	38	8	46	280
07:15	0	0	0	0	4	205	0	209	46	0	**13**	59	0	64	6	70	338
07:30	0	0	0	0	**6**	**252**	0	**258**	**71**	0	11	**82**	0	74	8	82	**422**
07:45	0	0	0	0	5	184	0	189	30	0	13	43	0	**81**	**16**	**97**	329
Total Volume	0	0	0	0	19	809	0	828	204	0	42	246	0	257	38	295	1369

PHF	.000	.000	.000	.000	.792	.803	.000	.802	.718	.000	.808	.750	.000	.793	.594	.760	.811



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

17:00	0	0	0	0	9	67	0	76	**16**	0	4	**20**	0	119	28	147	243
17:15	0	0	0	0	5	**80**	0	85	8	0	4	12	0	126	**30**	156	253
17:30	0	0	0	0	6	59	0	65	8	0	**6**	14	0	136	19	155	234
17:45	0	0	0	0	**12**	76	0	**88**	10	0	6	16	0	**144**	30	**174**	**278**
Total Volume	0	0	0	0	32	282	0	314	42	0	20	62	0	525	107	632	1008
% App. Total	0	0	0		10.2	89.8	0		67.7	0	32.3		0	83.1	16.9		
PHF	.000	.000	.000	.000	.667	.881	.000	.892	.656	.000	.833	.775	.000	.911	.892	.908	.906

All Traffic Data

(916) 771-8700

PITTSBURG

File Name : 10-7481-005 WOODHILL-LELAND
Site Code : 00000000
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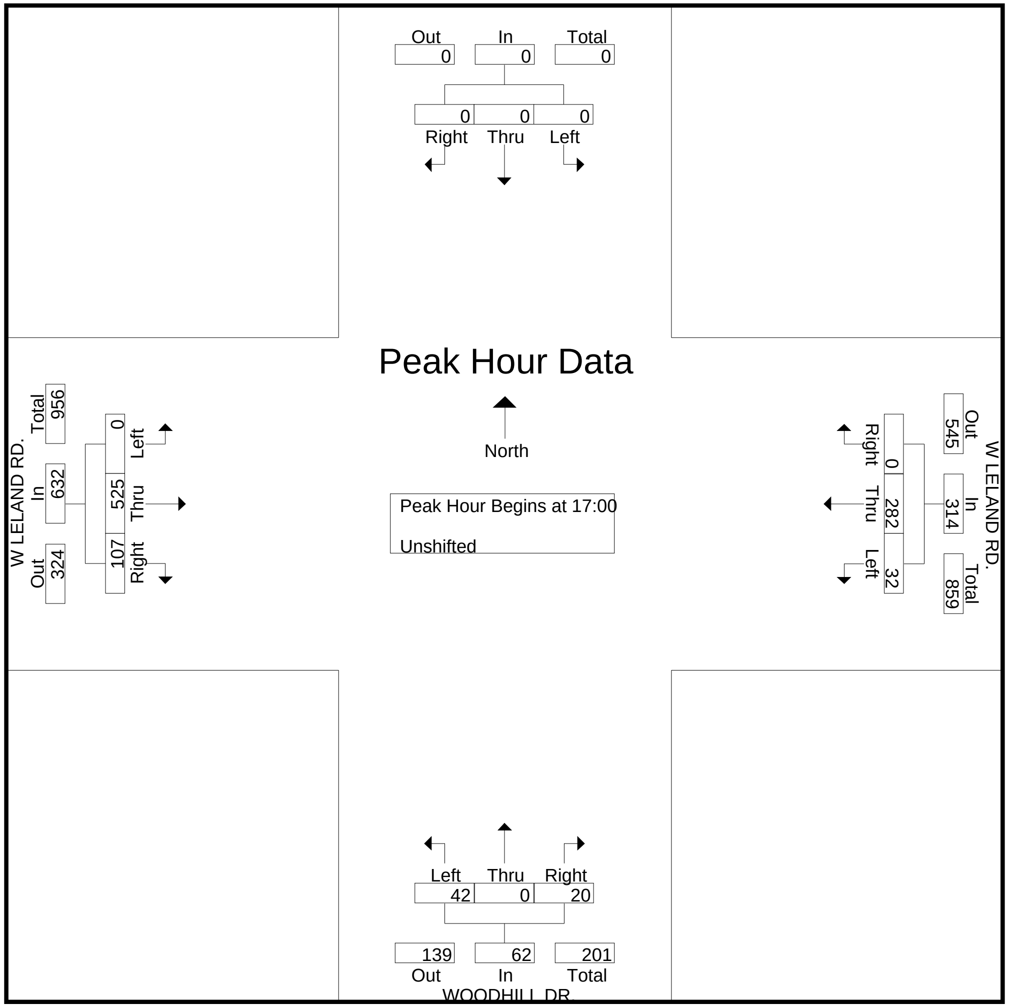


All Traffic Data

(916) 771-8700

PITTSBURG

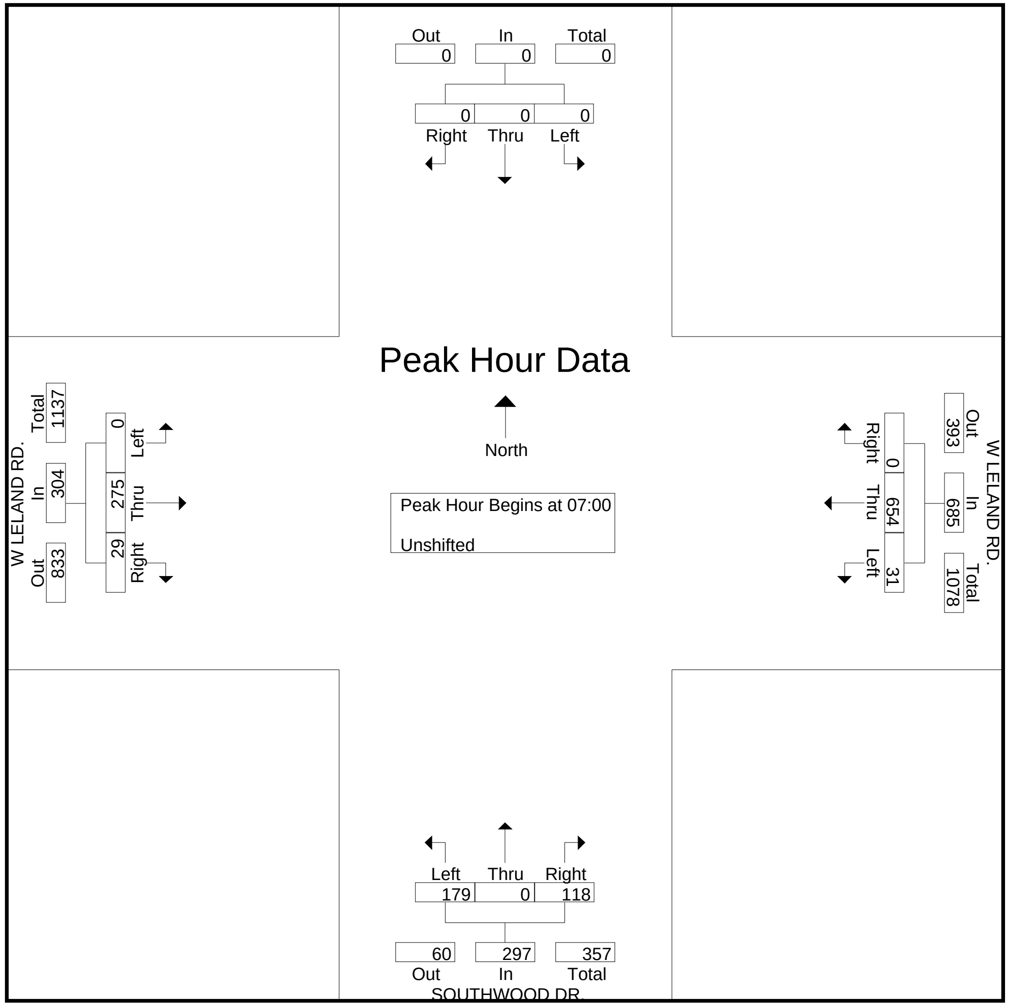
File Name : 10-7481-006 SOUTHWOOD-LELAND
Site Code : 00000000
Start Date : 11/17/2010
Page No : 1

Groups Printed- Unshifted

	Southbound				W LELAND RD. Westbound				SOUTHWOOD DR. Northbound				W LELAND RD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	0	0	0	0	7	142	0	149	33	0	25	58	0	42	2	44	251
07:15	0	0	0	0	5	157	0	162	51	0	29	80	0	74	4	78	320
07:30	0	0	0	0	8	207	0	215	56	0	38	94	0	74	11	85	394
07:45	0	0	0	0	11	148	0	159	39	0	26	65	0	85	12	97	321
Total	0	0	0	0	31	654	0	685	179	0	118	297	0	275	29	304	1286
08:00	0	0	0	0	13	107	0	120	8	0	22	30	0	74	17	91	241
08:15	0	0	0	0	15	83	0	98	11	0	14	25	0	39	6	45	168
08:30	0	0	0	0	8	54	0	62	20	0	15	35	0	54	6	60	157
08:45	0	0	0	0	15	42	0	57	14	0	31	45	0	32	7	39	141
Total	0	0	0	0	51	286	0	337	53	0	82	135	0	199	36	235	707
16:00	0	0	0	0	23	42	0	65	11	0	12	23	0	85	9	94	182
16:15	0	0	0	0	12	49	0	61	2	0	15	17	0	83	17	100	178
16:30	0	0	0	0	25	70	0	95	13	0	16	29	0	98	20	118	242
16:45	0	0	0	0	18	56	0	74	8	0	15	23	0	106	17	123	220
Total	0	0	0	0	78	217	0	295	34	0	58	92	0	372	63	435	822
17:00	0	0	0	0	19	68	0	87	5	0	16	21	0	98	24	122	230
17:15	0	0	0	0	40	78	0	118	10	0	23	33	0	102	24	126	277
17:30	0	0	0	0	19	48	0	67	15	0	15	30	0	124	30	154	251
17:45	0	0	0	0	15	74	0	89	14	0	16	30	0	119	18	137	256
Total	0	0	0	0	93	268	0	361	44	0	70	114	0	443	96	539	1014
Grand Total	0	0	0	0	253	1425	0	1678	310	0	328	638	0	1289	224	1513	3829
Apprch %	0	0	0		15.1	84.9	0		48.6	0	51.4		0	85.2	14.8		
Total %	0	0	0	0	6.6	37.2	0	43.8	8.1	0	8.6	16.7	0	33.7	5.9	39.5	

	Southbound				W LELAND RD. Westbound				SOUTHWOOD DR. Northbound				W LELAND RD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	0	0	0	0	7	142	0	149	33	0	25	58	0	42	2	44	251
07:15	0	0	0	0	5	157	0	162	51	0	29	80	0	74	4	78	320
07:30	0	0	0	0	8	**207**	0	**215**	**56**	0	**38**	**94**	0	74	11	85	**394**
07:45	0	0	0	0	**11**	148	0	159	39	0	26	65	0	**85**	**12**	**97**	321
Total Volume	0	0	0	0	31	654	0	685	179	0	118	297	0	275	29	304	1286

PHF	.000	.000	.000	.000	.705	.790	.000	.797	.799	.000	.776	.790	.000	.809	.604	.784	.816



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

17:00	0	0	0	0	19	68	0	87	5	0	16	21	0	98	24	122	230
17:15	0	0	0	0	**40**	**78**	0	**118**	10	0	**23**	**33**	0	102	24	126	**277**
17:30	0	0	0	0	19	48	0	67	**15**	0	15	30	0	**124**	**30**	**154**	251
17:45	0	0	0	0	15	74	0	89	14	0	16	30	0	119	18	137	256
Total Volume	0	0	0	0	93	268	0	361	44	0	70	114	0	443	96	539	1014
% App. Total	0	0	0		25.8	74.2	0		38.6	0	61.4		0	82.2	17.8		
PHF	.000	.000	.000	.000	.581	.859	.000	.765	.733	.000	.761	.864	.000	.893	.800	.875	.915

All Traffic Data

(916) 771-8700

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File Name : 10-7481-006 SOUTHWOOD-LELAND
Site Code : 00000000
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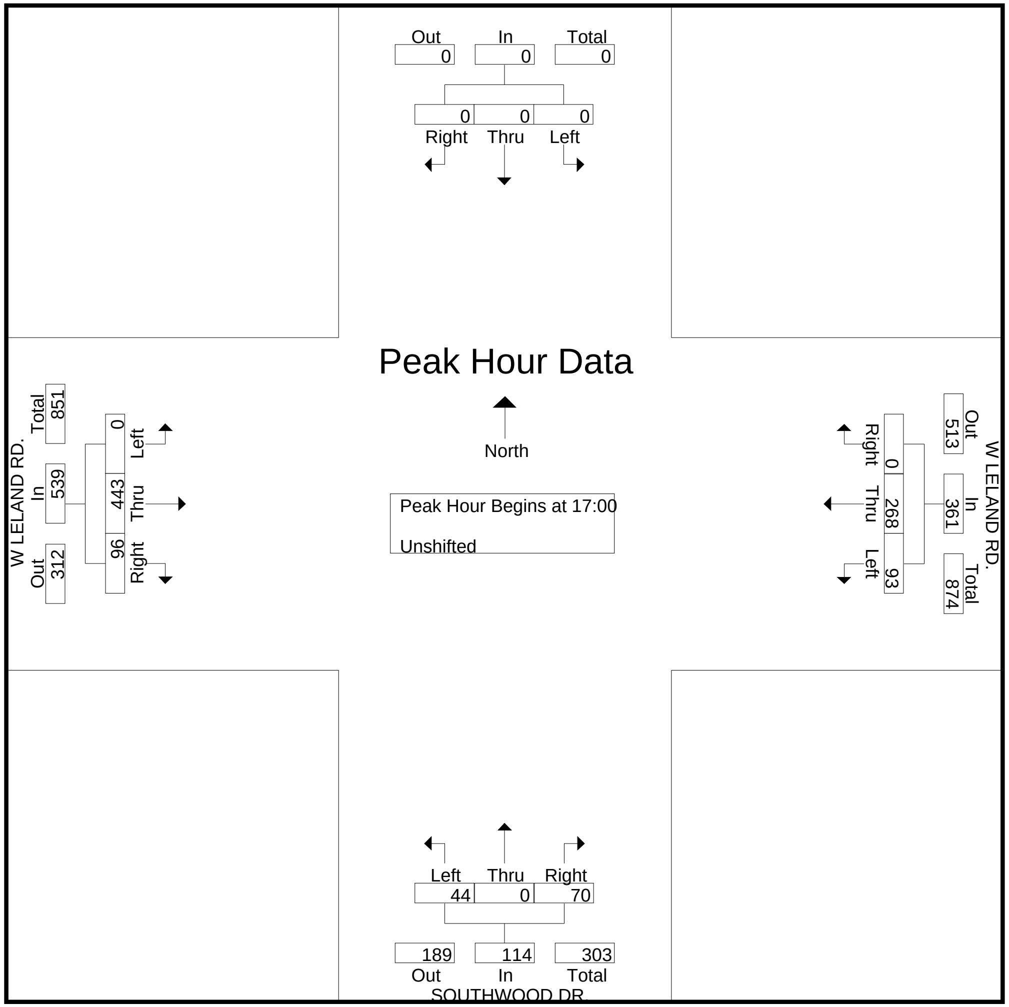


All Traffic Data

(916) 771-8700

PITTSBURG

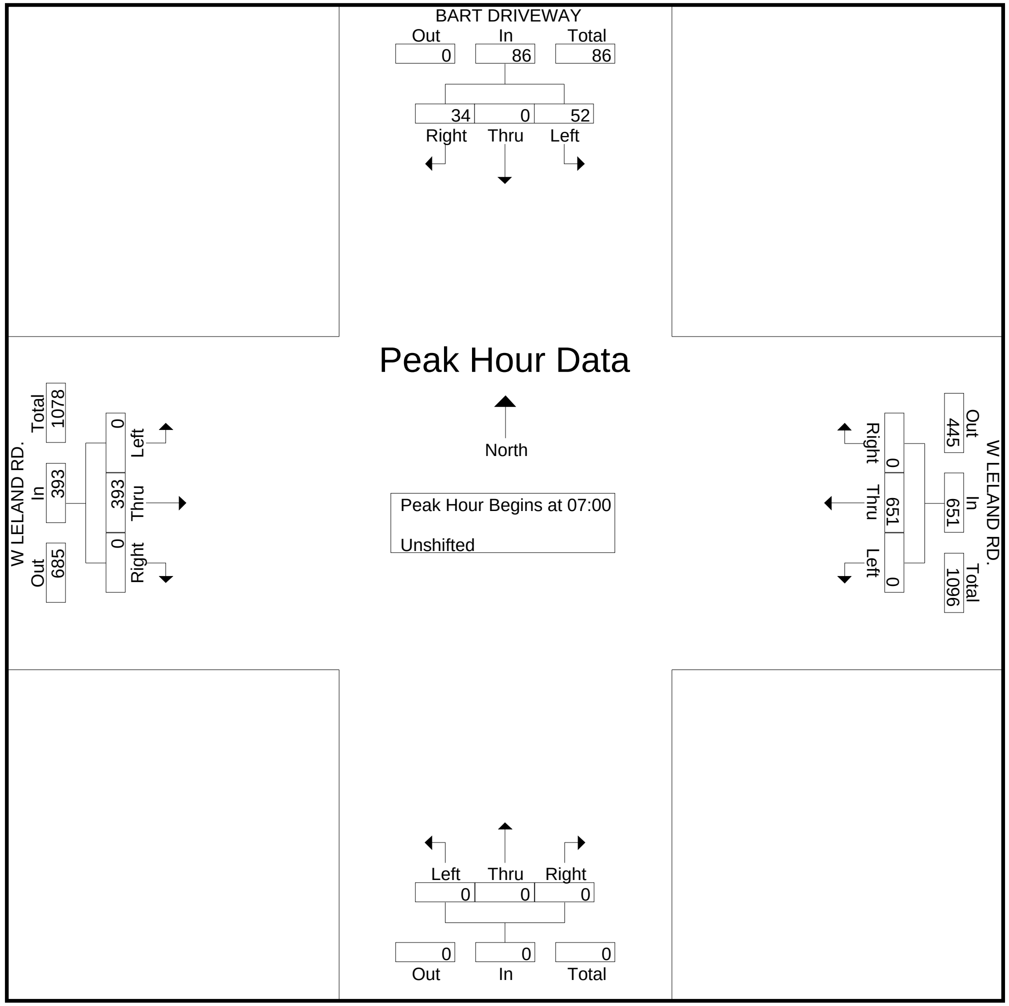
File Name : 10-7481-007 A-BART DW-LELAND
Site Code : 00000000
Start Date : 11/17/2010
Page No : 1

Groups Printed- Unshifted

	BART DRIVEWAY Southbound				W LELAND RD. Westbound				Northbound				W LELAND RD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	15	0	12	27	0	137	0	137	0	0	0	0	0	67	0	67	231
07:15	7	0	8	15	0	154	0	154	0	0	0	0	0	103	0	103	272
07:30	15	0	7	22	0	208	0	208	0	0	0	0	0	112	0	112	342
07:45	15	0	7	22	0	152	0	152	0	0	0	0	0	111	0	111	285
Total	52	0	34	86	0	651	0	651	0	0	0	0	0	393	0	393	1130
08:00	9	0	12	21	0	108	0	108	0	0	0	0	0	96	0	96	225
08:15	15	0	17	32	0	81	0	81	0	0	0	0	0	53	0	53	166
08:30	10	0	6	16	0	56	0	56	0	0	0	0	0	69	0	69	141
08:45	12	0	3	15	0	54	0	54	0	0	0	0	0	63	0	63	132
Total	46	0	38	84	0	299	0	299	0	0	0	0	0	281	0	281	664
16:00	59	0	4	63	0	61	0	61	0	0	0	0	0	97	0	97	221
16:15	14	0	3	17	0	58	0	58	0	0	0	0	0	98	0	98	173
16:30	96	0	23	119	0	72	0	72	0	0	0	0	0	114	0	114	305
16:45	53	0	8	61	0	66	0	66	0	0	0	0	0	121	0	121	248
Total	222	0	38	260	0	257	0	257	0	0	0	0	0	430	0	430	947
17:00	134	0	16	150	0	71	0	71	0	0	0	0	0	114	0	114	335
17:15	111	0	24	135	0	94	0	94	0	0	0	0	0	125	0	125	354
17:30	77	0	13	90	0	54	0	54	0	0	0	0	0	139	0	139	283
17:45	128	0	24	152	0	65	0	65	0	0	0	0	0	135	0	135	352
Total	450	0	77	527	0	284	0	284	0	0	0	0	0	513	0	513	1324
Grand Total	770	0	187	957	0	1491	0	1491	0	0	0	0	0	1617	0	1617	4065
Apprch %	80.5	0	19.5		0	100	0		0	0	0		0	100	0		
Total %	18.9	0	4.6	23.5	0	36.7	0	36.7	0	0	0	0	0	39.8	0	39.8	

	BART DRIVEWAY Southbound				W LELAND RD. Westbound				Northbound				W LELAND RD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	**15**	0	**12**	**27**	0	137	0	137	0	0	0	0	0	67	0	67	231
07:15	7	0	8	15	0	154	0	154	0	0	0	0	0	103	0	103	272
07:30	15	0	7	22	0	**208**	0	**208**	0	0	0	0	0	**112**	0	**112**	**342**
07:45	15	0	7	22	0	152	0	152	0	0	0	0	0	111	0	111	285
Total Volume	52	0	34	86	0	651	0	651	0	0	0	0	0	393	0	393	1130

PHF	.867	.000	.708	.796	.000	.782	.000	.782	.000	.000	.000	.000	.000	.877	.000	.877	.826



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

17:00	**134**	0	16	150	0	71	0	71	0	0	0	0	0	114	0	114	335
17:15	111	0	**24**	135	0	**94**	0	**94**	0	0	0	0	0	125	0	125	**354**
17:30	77	0	13	90	0	54	0	54	0	0	0	0	0	**139**	0	**139**	283
17:45	128	0	24	**152**	0	65	0	65	0	0	0	0	0	135	0	135	352
Total Volume	450	0	77	527	0	284	0	284	0	0	0	0	0	513	0	513	1324
% App. Total	85.4	0	14.6		0	100	0		0	0	0		0	100	0		
PHF	.840	.000	.802	.867	.000	.755	.000	.755	.000	.000	.000	.000	.000	.923	.000	.923	.935

All Traffic Data

(916) 771-8700

PITTSBURG

File Name : 10-7481-007 A-BART DW-LELAND
Site Code : 00000000
Start Date : 11/17/2010
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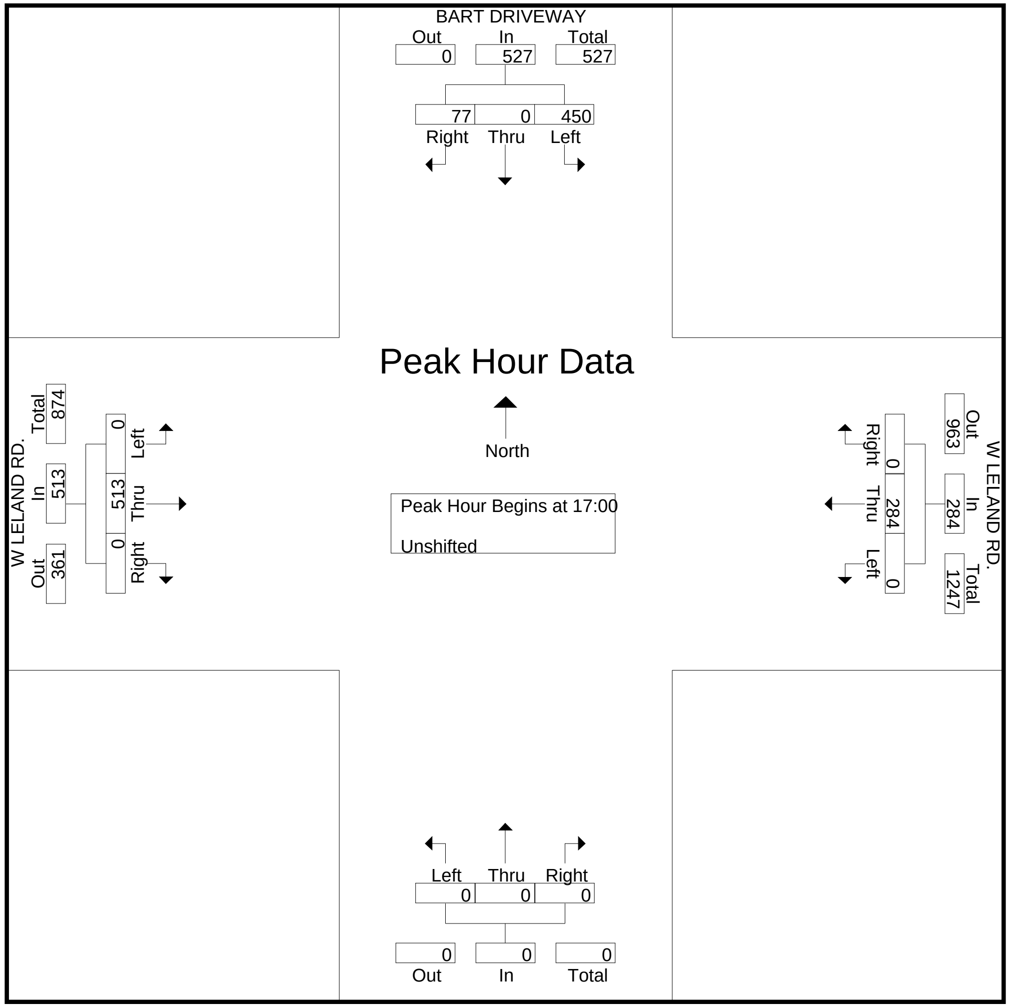


All Traffic Data

(916) 771-8700

PITTSBURG

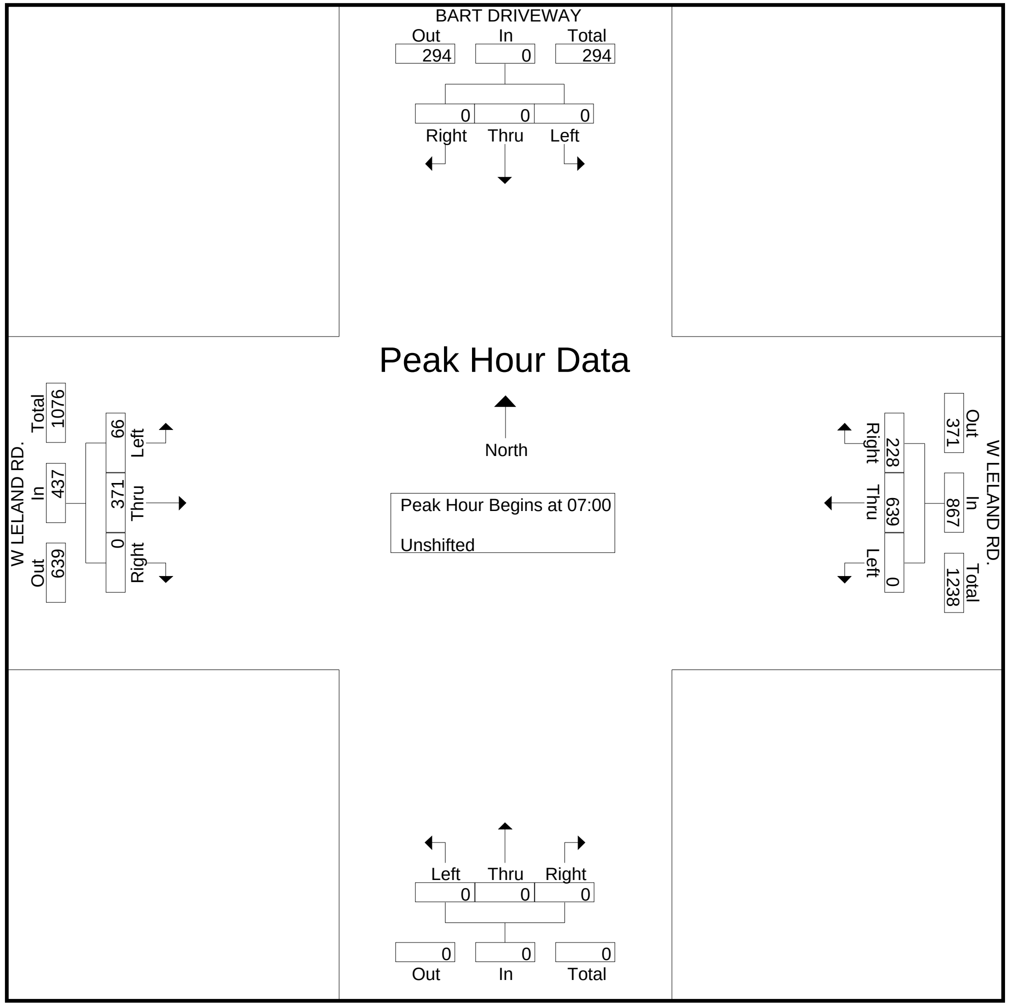
File Name : 10-7481-009 C-BART DW-LELAND
Site Code : 00000000
Start Date : 11/17/2010
Page No : 1

Groups Printed- Unshifted

	BART DRIVEWAY Southbound				W LELAND RD. Westbound				Northbound				W LELAND RD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	0	0	0	0	0	132	64	196	0	0	0	0	19	65	0	84	280
07:15	0	0	0	0	0	147	82	229	0	0	0	0	15	92	0	107	336
07:30	0	0	0	0	0	206	43	249	0	0	0	0	16	111	0	127	376
07:45	0	0	0	0	0	154	39	193	0	0	0	0	16	103	0	119	312
Total	0	0	0	0	0	639	228	867	0	0	0	0	66	371	0	437	1304
08:00	0	0	0	0	0	114	22	136	0	0	0	0	11	101	0	112	248
08:15	0	0	0	0	0	78	26	104	0	0	0	0	3	63	0	66	170
08:30	0	0	0	0	0	61	20	81	0	0	0	0	4	77	0	81	162
08:45	0	0	0	0	0	50	11	61	0	0	0	0	5	69	0	74	135
Total	0	0	0	0	0	303	79	382	0	0	0	0	23	310	0	333	715
16:00	0	0	0	0	0	61	21	82	0	0	0	0	6	143	0	149	231
16:15	0	0	0	0	0	59	14	73	0	0	0	0	5	117	0	122	195
16:30	0	0	0	0	0	72	20	92	0	0	0	0	15	191	0	206	298
16:45	0	0	0	0	0	67	20	87	0	0	0	0	11	167	0	178	265
Total	0	0	0	0	0	259	75	334	0	0	0	0	37	618	0	655	989
17:00	0	0	0	0	0	65	21	86	0	0	0	0	8	231	0	239	325
17:15	0	0	0	0	0	100	21	121	0	0	0	0	6	228	0	234	355
17:30	0	0	0	0	0	59	34	93	0	0	0	0	9	213	0	222	315
17:45	0	0	0	0	0	61	21	82	0	0	0	0	13	240	0	253	335
Total	0	0	0	0	0	285	97	382	0	0	0	0	36	912	0	948	1330
Grand Total	0	0	0	0	0	1486	479	1965	0	0	0	0	162	2211	0	2373	4338
Apprch %	0	0	0		0	75.6	24.4		0	0	0		6.8	93.2	0		
Total %	0	0	0	0	0	34.3	11	45.3	0	0	0	0	3.7	51	0	54.7	

	BART DRIVEWAY Southbound				W LELAND RD. Westbound				Northbound				W LELAND RD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	0	0	0	0	0	132	64	196	0	0	0	0	**19**	65	0	84	280
07:15	0	0	0	0	0	147	**82**	229	0	0	0	0	15	92	0	107	336
07:30	0	0	0	0	0	**206**	43	**249**	0	0	0	0	16	**111**	0	**127**	**376**
07:45	0	0	0	0	0	154	39	193	0	0	0	0	16	103	0	119	312
Total Volume	0	0	0	0	0	639	228	867	0	0	0	0	66	371	0	437	1304

PHF	.000	.000	.000	.000	.000	.775	.695	.870	.000	.000	.000	.000	.868	.836	.000	.860	.867



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

17:00	0	0	0	0	0	65	21	86	0	0	0	0	8	231	0	239	325
17:15	0	0	0	0	0	**100**	21	**121**	0	0	0	0	6	228	0	234	**355**
17:30	0	0	0	0	0	59	**34**	93	0	0	0	0	9	213	0	222	315
17:45	0	0	0	0	0	61	21	82	0	0	0	0	**13**	**240**	0	**253**	335
Total Volume	0	0	0	0	0	285	97	382	0	0	0	0	36	912	0	948	1330
% App. Total	0	0	0		0	74.6	25.4		0	0	0		3.8	96.2	0		
PHF	.000	.000	.000	.000	.000	.713	.713	.789	.000	.000	.000	.000	.692	.950	.000	.937	.937

All Traffic Data

(916) 771-8700

PITTSBURG

File Name : 10-7481-009 C-BART DW-LELAND
Site Code : 00000000
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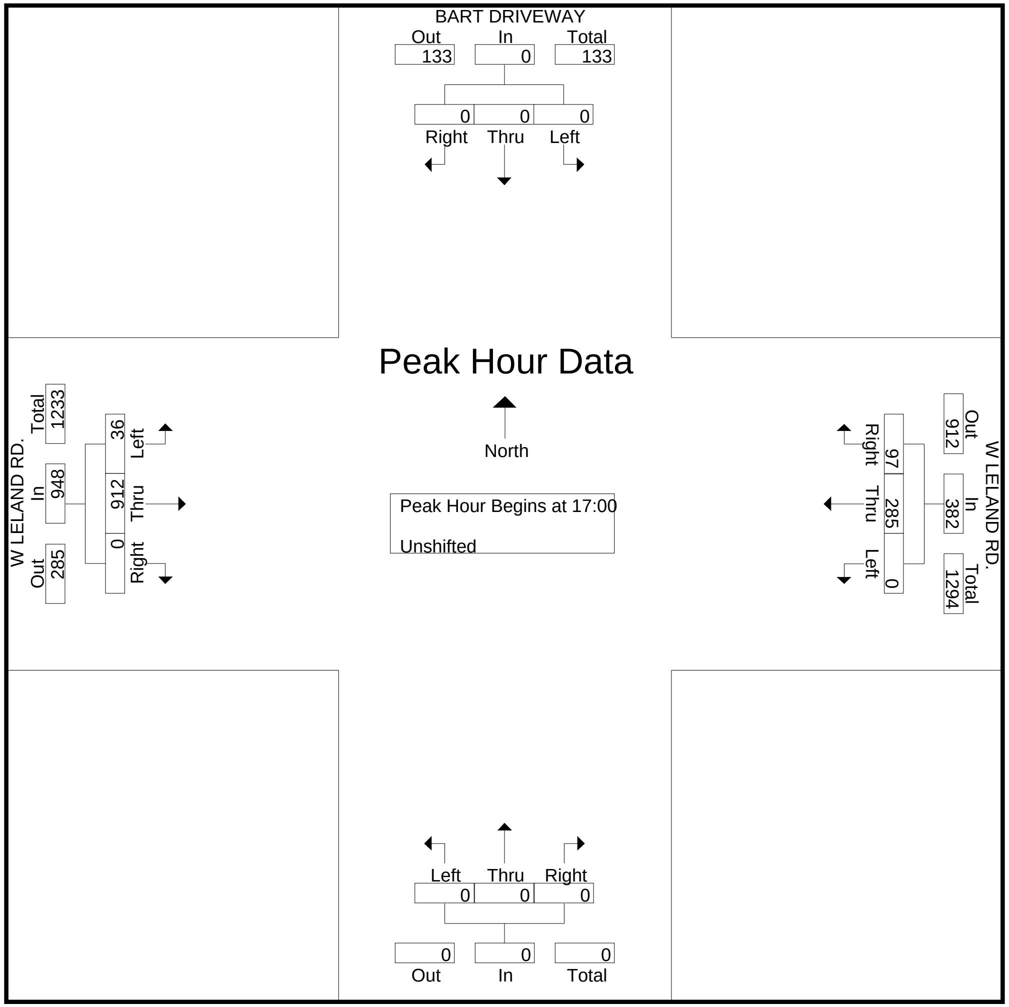


All Traffic Data

(916) 771-8700

PITTSBURG

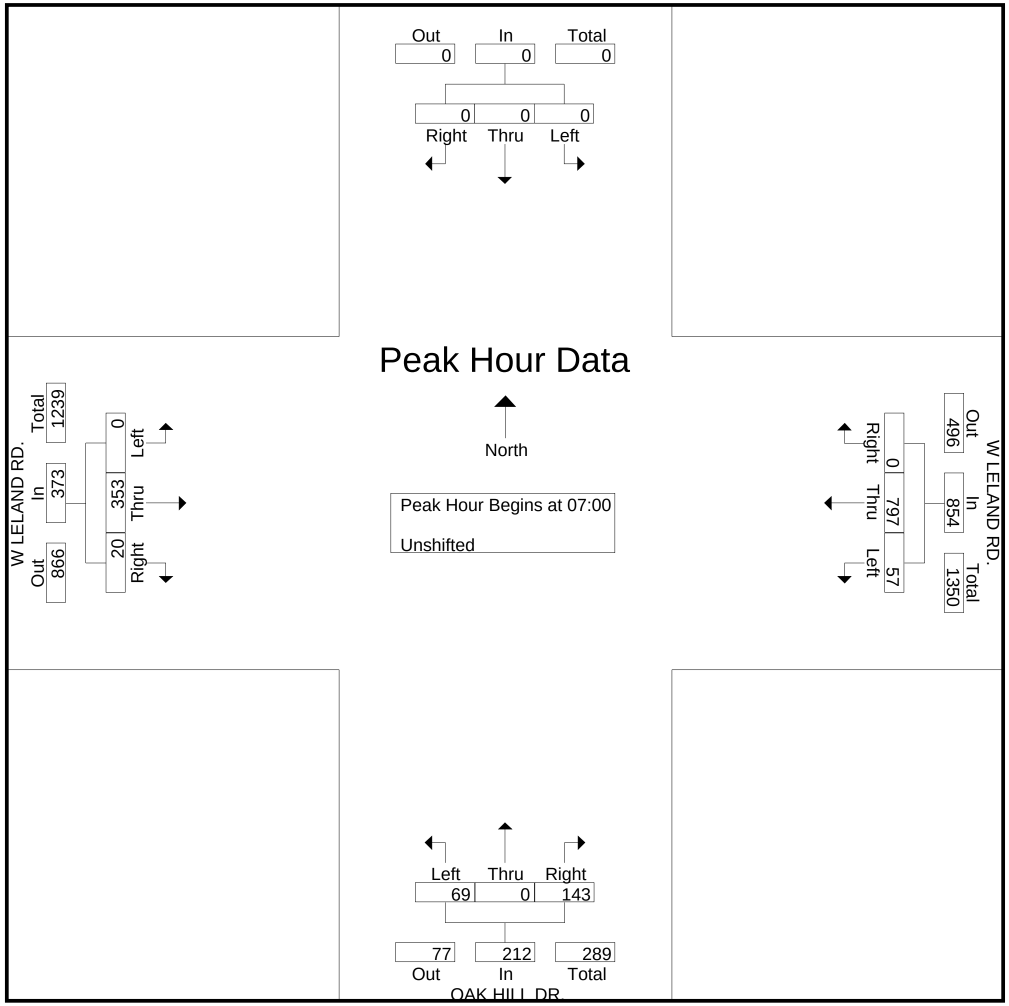
File Name : 10-7481-010 OAK HILL-LELAND
Site Code : 00000000
Start Date : 11/17/2010
Page No : 1

Groups Printed- Unshifted

	Southbound				W LELAND RD. Westbound				OAK HILL DR. Northbound				W LELAND RD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	0	0	0	0	14	188	0	202	18	0	26	44	0	64	6	70	316
07:15	0	0	0	0	8	199	0	207	18	0	32	50	0	84	1	85	342
07:30	0	0	0	0	16	235	0	251	22	0	49	71	0	112	3	115	437
07:45	0	0	0	0	19	175	0	194	11	0	36	47	0	93	10	103	344
Total	0	0	0	0	57	797	0	854	69	0	143	212	0	353	20	373	1439
08:00	0	0	0	0	24	128	0	152	7	0	24	31	0	94	8	102	285
08:15	0	0	0	0	18	98	0	116	5	0	32	37	0	60	5	65	218
08:30	0	0	0	0	15	75	0	90	3	0	35	38	0	65	5	70	198
08:45	0	0	0	0	19	50	0	69	10	0	19	29	0	69	4	73	171
Total	0	0	0	0	76	351	0	427	25	0	110	135	0	288	22	310	872
16:00	0	0	0	0	31	80	0	111	3	0	12	15	0	138	5	143	269
16:15	0	0	0	0	21	69	0	90	3	0	19	22	0	106	7	113	225
16:30	0	0	0	0	34	79	0	113	8	0	13	21	0	181	13	194	328
16:45	0	0	0	0	32	83	0	115	2	0	23	25	0	175	10	185	325
Total	0	0	0	0	118	311	0	429	16	0	67	83	0	600	35	635	1147
17:00	0	0	0	0	27	88	0	115	4	0	24	28	0	198	12	210	353
17:15	0	0	0	0	33	111	0	144	4	0	26	30	0	215	11	226	400
17:30	0	0	0	0	39	87	0	126	9	0	27	36	0	193	20	213	375
17:45	0	0	0	0	45	77	0	122	5	0	27	32	0	219	14	233	387
Total	0	0	0	0	144	363	0	507	22	0	104	126	0	825	57	882	1515
Grand Total	0	0	0	0	395	1822	0	2217	132	0	424	556	0	2066	134	2200	4973
Apprch %	0	0	0		17.8	82.2	0		23.7	0	76.3		0	93.9	6.1		
Total %	0	0	0	0	7.9	36.6	0	44.6	2.7	0	8.5	11.2	0	41.5	2.7	44.2	

	Southbound				W LELAND RD. Westbound				OAK HILL DR. Northbound				W LELAND RD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	0	0	0	0	14	188	0	202	18	0	26	44	0	64	6	70	316
07:15	0	0	0	0	8	199	0	207	18	0	32	50	0	84	1	85	342
07:30	0	0	0	0	16	**235**	0	**251**	**22**	0	**49**	**71**	0	**112**	3	**115**	**437**
07:45	0	0	0	0	**19**	175	0	194	11	0	36	47	0	93	**10**	103	344
Total Volume	0	0	0	0	57	797	0	854	69	0	143	212	0	353	20	373	1439

PHF	.000	.000	.000	.000	.750	.848	.000	.851	.784	.000	.730	.746	.000	.788	.500	.811	.823



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

17:00	0	0	0	0	27	88	0	115	4	0	24	28	0	198	12	210	353
17:15	0	0	0	0	33	**111**	0	**144**	4	0	26	30	0	215	11	226	**400**
17:30	0	0	0	0	39	87	0	126	**9**	0	**27**	**36**	0	193	**20**	213	375
17:45	0	0	0	0	**45**	77	0	122	5	0	27	32	0	**219**	14	**233**	387
Total Volume	0	0	0	0	144	363	0	507	22	0	104	126	0	825	57	882	1515
% App. Total	0	0	0		28.4	71.6	0		17.5	0	82.5		0	93.5	6.5		
PHF	.000	.000	.000	.000	.800	.818	.000	.880	.611	.000	.963	.875	.000	.942	.713	.946	.947

All Traffic Data

(916) 771-8700

PITTSBURG

File Name : 10-7481-010 OAK HILL-LELAND
Site Code : 00000000
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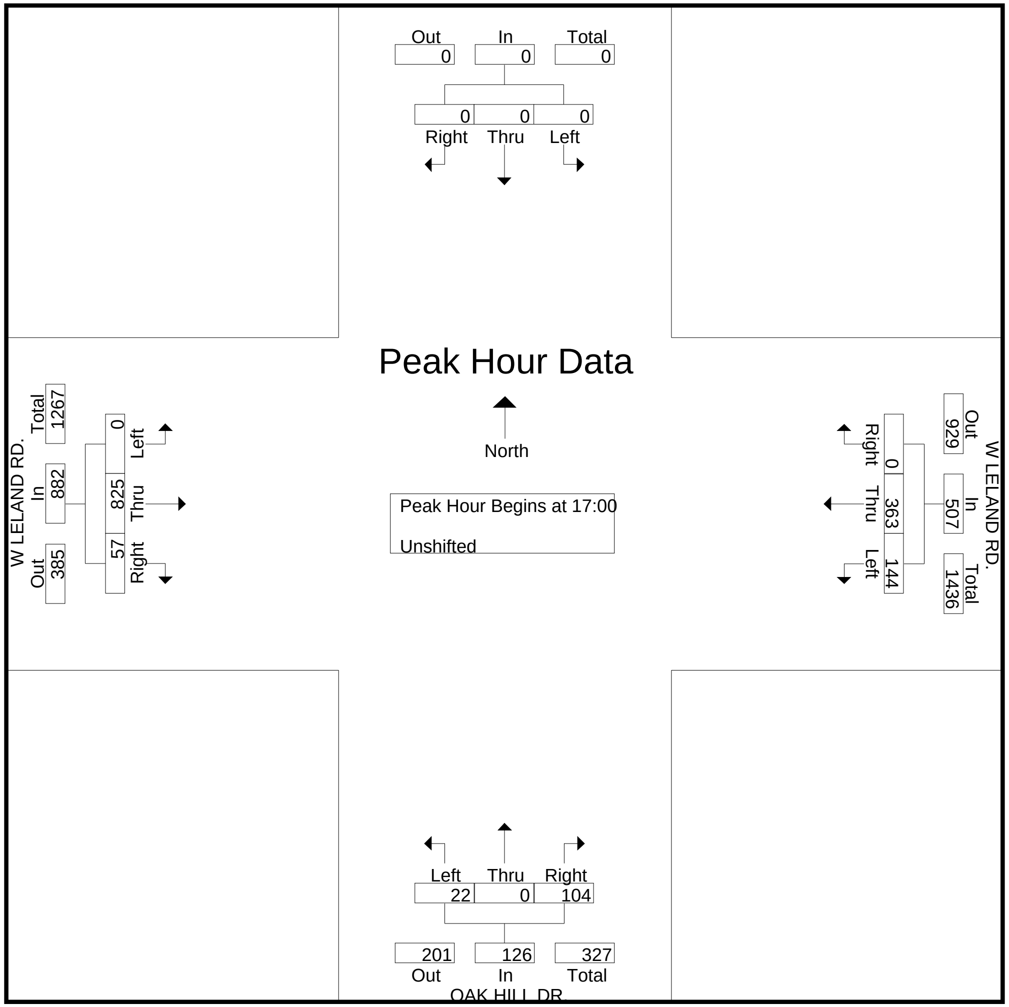

All Traffic Data

(916) 771-8700

PITTSBURG

File Name : 10-7481-011 BAILEY-WILLOW PASS
Site Code : 00000000
Start Date : 11/18/2010
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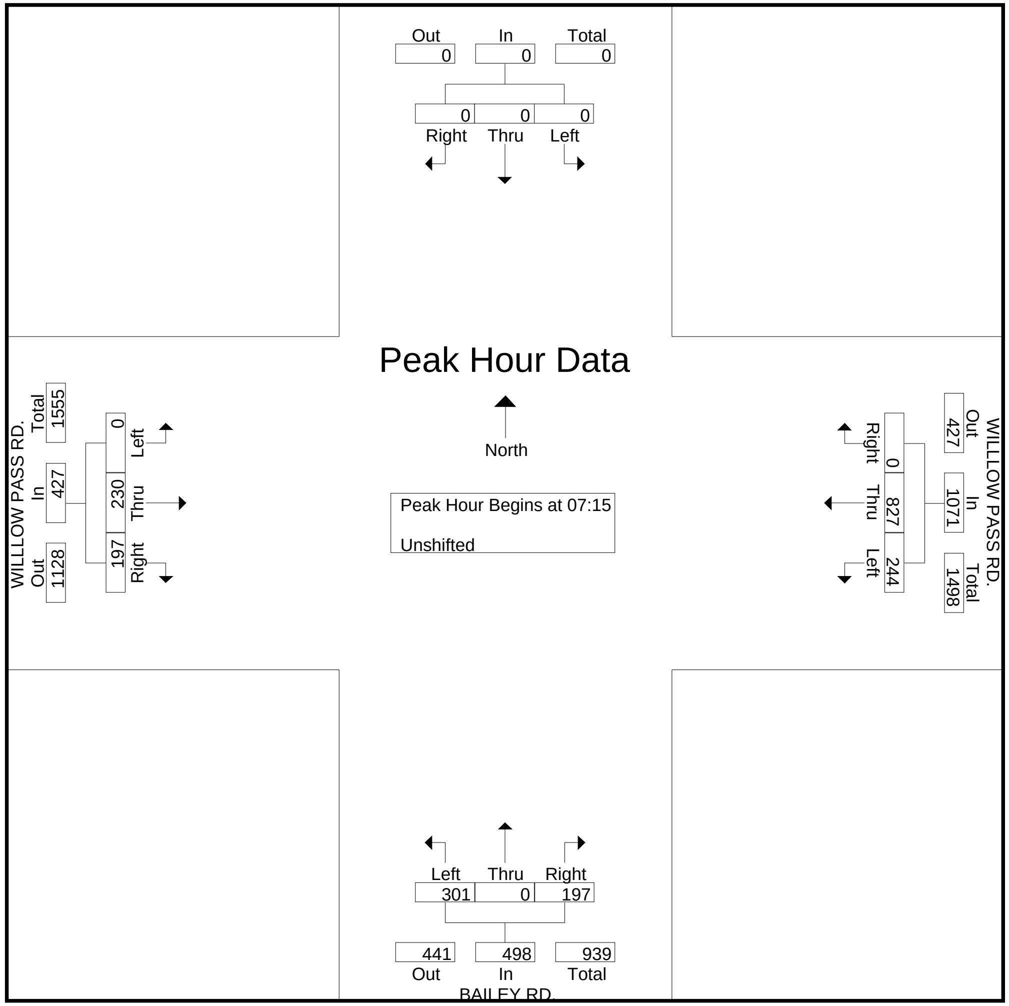
Groups Printed- Unshifted

	Southbound				WILLLOW PASS RD. Westbound				BAILEY RD. Northbound				WILLLOW PASS RD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	0	0	0	0	65	148	0	213	45	0	26	71	0	26	20	46	330
07:15	0	0	0	0	49	224	0	273	66	0	51	117	0	34	31	65	455
07:30	0	0	0	0	37	205	0	242	79	0	35	114	0	84	55	139	495
07:45	0	0	0	0	72	214	0	286	84	0	49	133	0	56	51	107	526
Total	0	0	0	0	223	791	0	1014	274	0	161	435	0	200	157	357	1806
08:00	0	0	0	0	86	184	0	270	72	0	62	134	0	56	60	116	520
08:15	0	0	0	0	50	120	0	170	57	0	40	97	0	55	46	101	368
08:30	0	0	0	0	47	97	0	144	29	0	52	81	0	46	35	81	306
08:45	0	0	0	0	53	81	0	134	28	0	46	74	0	40	38	78	286
Total	0	0	0	0	236	482	0	718	186	0	200	386	0	197	179	376	1480
16:00	0	0	0	0	46	72	0	118	73	0	92	165	0	88	43	131	414
16:15	0	0	0	0	54	72	0	126	66	0	98	164	0	72	21	93	383
16:30	0	0	0	0	56	64	0	120	53	0	105	158	0	121	67	188	466
16:45	0	0	0	0	41	84	0	125	56	0	115	171	0	128	84	212	508
Total	0	0	0	0	197	292	0	489	248	0	410	658	0	409	215	624	1771
17:00	0	0	0	0	53	83	0	136	67	0	98	165	0	126	60	186	487
17:15	0	0	0	0	75	73	0	148	85	0	108	193	0	128	51	179	520
17:30	0	0	0	0	57	68	0	125	86	0	124	210	0	123	83	206	541
17:45	0	0	0	0	63	58	0	121	87	0	135	222	0	103	85	188	531
Total	0	0	0	0	248	282	0	530	325	0	465	790	0	480	279	759	2079
Grand Total	0	0	0	0	904	1847	0	2751	1033	0	1236	2269	0	1286	830	2116	7136
Apprch %	0	0	0		32.9	67.1	0		45.5	0	54.5		0	60.8	39.2		
Total %	0	0	0	0	12.7	25.9	0	38.6	14.5	0	17.3	31.8	0	18	11.6	29.7	

	Southbound				WILLLOW PASS RD. Westbound				BAILEY RD. Northbound				WILLLOW PASS RD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15																	
07:15	0	0	0	0	49	**224**	0	273	66	0	51	117	0	34	31	65	455
07:30	0	0	0	0	37	205	0	242	79	0	35	114	0	**84**	55	**139**	495
07:45	0	0	0	0	72	214	0	**286**	**84**	0	49	133	0	56	51	107	**526**
08:00	0	0	0	0	**86**	184	0	270	72	0	**62**	**134**	0	56	**60**	116	520
Total Volume	0	0	0	0	244	827	0	1071	301	0	197	498	0	230	197	427	1996

PHF	.000	.000	.000	.000	.709	.923	.000	.936	.896	.000	.794	.929	.000	.685	.821	.768	.949



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

17:00	0	0	0	0	53	**83**	0	136	67	0	98	165	0	126	60	186	487
17:15	0	0	0	0	**75**	73	0	**148**	85	0	108	193	0	**128**	51	179	520
17:30	0	0	0	0	57	68	0	125	86	0	124	210	0	123	83	**206**	**541**
17:45	0	0	0	0	63	58	0	121	**87**	0	**135**	**222**	0	103	**85**	188	531
Total Volume	0	0	0	0	248	282	0	530	325	0	465	790	0	480	279	759	2079
% App. Total	0	0	0		46.8	53.2	0		41.1	0	58.9		0	63.2	36.8		
PHF	.000	.000	.000	.000	.827	.849	.000	.895	.934	.000	.861	.890	.000	.938	.821	.921	.961

All Traffic Data

(916) 771-8700

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File Name : 10-7481-011 BAILEY-WILLOW PASS
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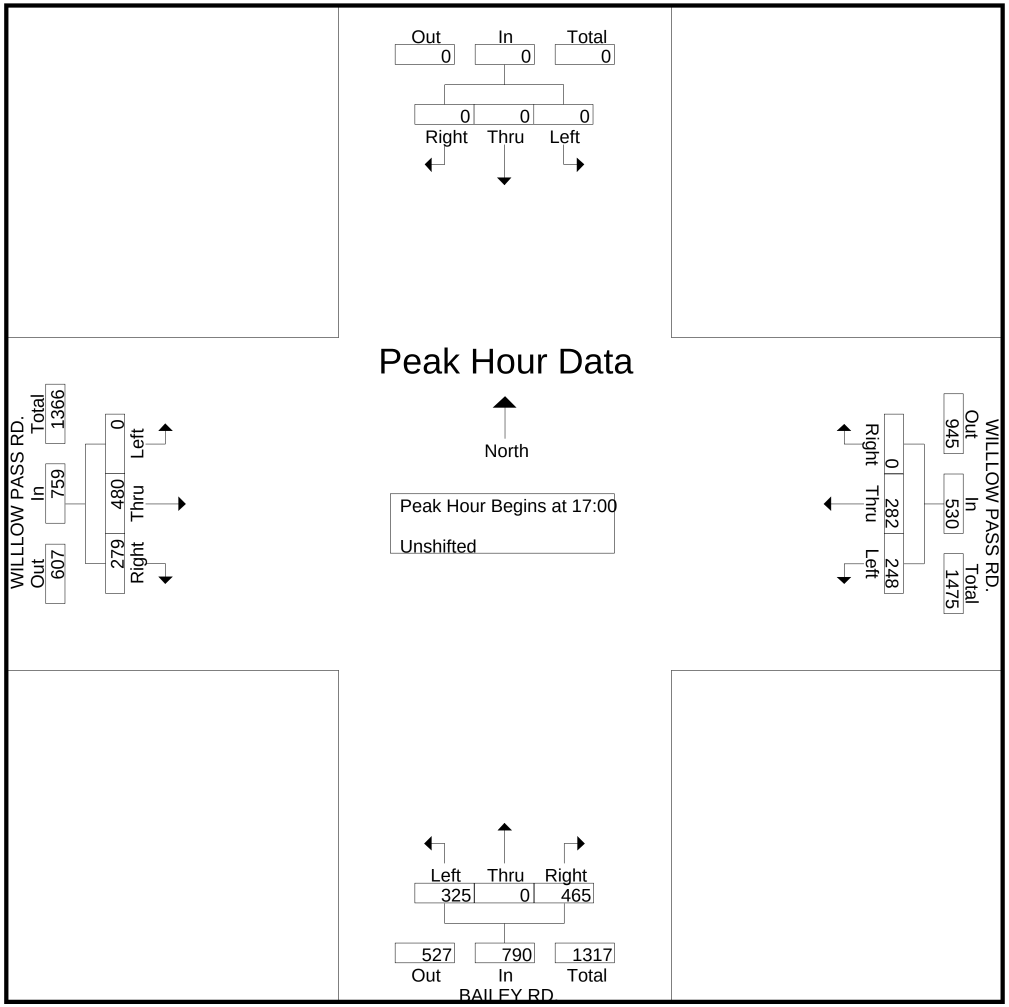


All Traffic Data

(916) 771-8700

PITTSBURG

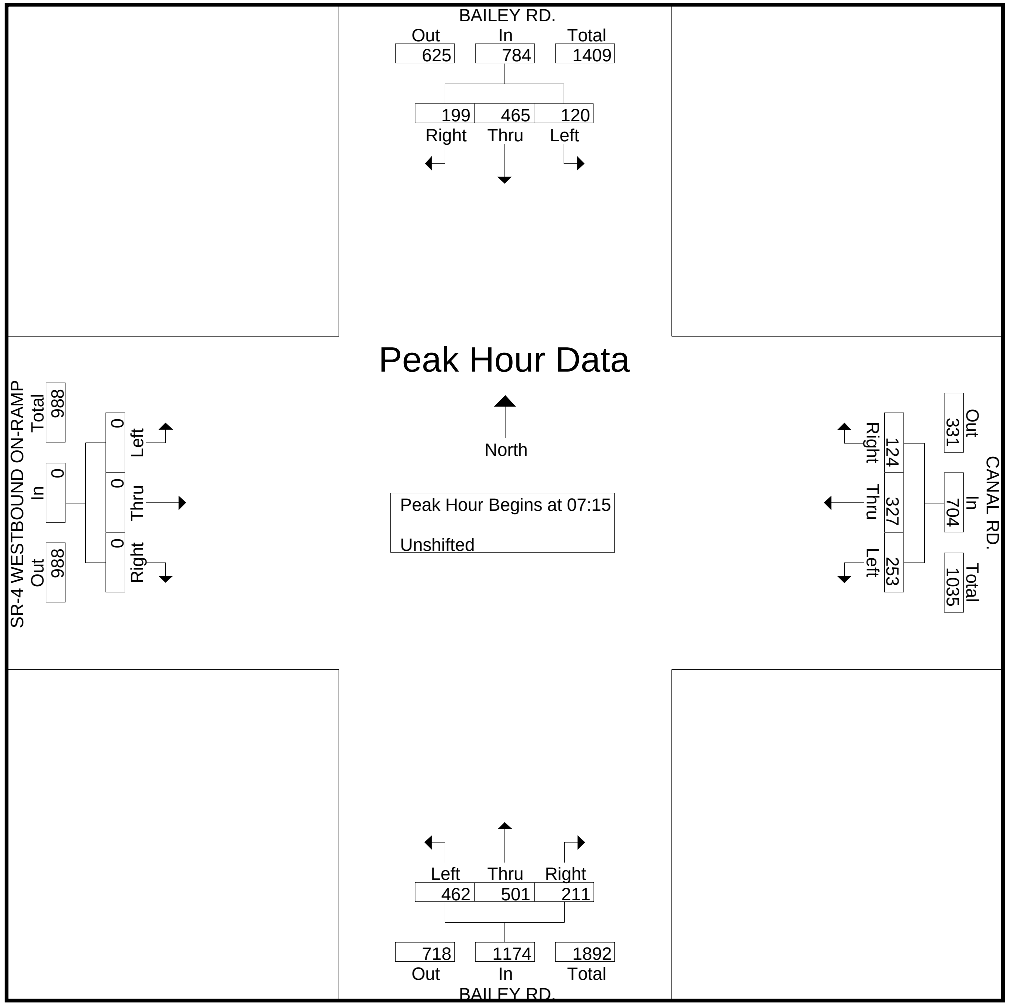
File Name : 10-7481-012 BAILEY-CANAL
Site Code : 00000000
Start Date : 11/18/2010
Page No : 1

Groups Printed- Unshifted

	BAILEY RD. Southbound				CANAL RD. Westbound				BAILEY RD. Northbound				SR-4 WESTBOUND ON-RAMP Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	6	104	62	172	42	84	9	135	133	99	45	277	0	0	0	0	584
07:15	18	92	47	157	49	112	21	182	117	123	52	292	0	0	0	0	631
07:30	38	116	46	200	73	74	26	173	128	129	47	304	0	0	0	0	677
07:45	39	122	48	209	67	69	36	172	119	122	57	298	0	0	0	0	679
Total	101	434	203	738	231	339	92	662	497	473	201	1171	0	0	0	0	2571
08:00	25	135	58	218	64	72	41	177	98	127	55	280	0	0	0	0	675
08:15	14	106	45	165	57	61	17	135	89	115	51	255	0	0	0	0	555
08:30	11	84	48	143	30	48	9	87	103	89	35	227	0	0	0	0	457
08:45	1	77	55	133	31	51	9	91	90	75	32	197	0	0	0	0	421
Total	51	402	206	659	182	232	76	490	380	406	173	959	0	0	0	0	2108
16:00	35	114	45	194	20	42	10	72	65	198	111	374	0	0	0	0	640
16:15	28	96	45	169	22	31	7	60	57	198	132	387	0	0	0	0	616
16:30	36	102	45	183	32	43	10	85	70	207	156	433	0	0	0	0	701
16:45	30	105	30	165	31	29	10	70	64	239	187	490	0	0	0	0	725
Total	129	417	165	711	105	145	37	287	256	842	586	1684	0	0	0	0	2682
17:00	26	105	41	172	37	46	13	96	53	255	172	480	0	0	0	0	748
17:15	34	111	44	189	43	41	21	105	65	261	202	528	0	0	0	0	822
17:30	37	135	43	215	37	48	29	114	76	238	175	489	0	0	0	0	818
17:45	38	118	32	188	39	30	14	83	60	259	174	493	0	0	0	0	764
Total	135	469	160	764	156	165	77	398	254	1013	723	1990	0	0	0	0	3152
Grand Total	416	1722	734	2872	674	881	282	1837	1387	2734	1683	5804	0	0	0	0	10513
Apprch %	14.5	60	25.6		36.7	48	15.4		23.9	47.1	29		0	0	0		
Total %	4	16.4	7	27.3	6.4	8.4	2.7	17.5	13.2	26	16	55.2	0	0	0	0	

	BAILEY RD. Southbound				CANAL RD. Westbound				BAILEY RD. Northbound				SR-4 WESTBOUND ON-RAMP Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15																	
07:15	18	92	47	157	49	**112**	21	**182**	117	123	52	292	0	0	0	0	631
07:30	38	116	46	200	**73**	74	26	173	**128**	**129**	47	**304**	0	0	0	0	677
07:45	**39**	122	48	209	67	69	36	172	119	122	**57**	298	0	0	0	0	**679**
08:00	25	**135**	**58**	**218**	64	72	**41**	177	98	127	55	280	0	0	0	0	675
Total Volume	120	465	199	784	253	327	124	704	462	501	211	1174	0	0	0	0	2662

PHF	.769	.861	.858	.899	.866	.730	.756	.967	.902	.971	.925	.965	.000	.000	.000	.000	.980



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

17:00	26	105	41	172	37	46	13	96	53	255	172	480	0	0	0	0	748
17:15	34	111	**44**	189	**43**	41	21	105	65	**261**	**202**	**528**	0	0	0	0	**822**
17:30	37	**135**	43	**215**	37	**48**	**29**	**114**	**76**	238	175	489	0	0	0	0	818
17:45	**38**	118	32	188	39	30	14	83	60	259	174	493	0	0	0	0	764
Total Volume	135	469	160	764	156	165	77	398	254	1013	723	1990	0	0	0	0	3152
% App. Total	17.7	61.4	20.9		39.2	41.5	19.3		12.8	50.9	36.3		0	0	0		
PHF	.888	.869	.909	.888	.907	.859	.664	.873	.836	.970	.895	.942	.000	.000	.000	.000	.959

All Traffic Data

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File Name : 10-7481-012 BAILEY-CANAL
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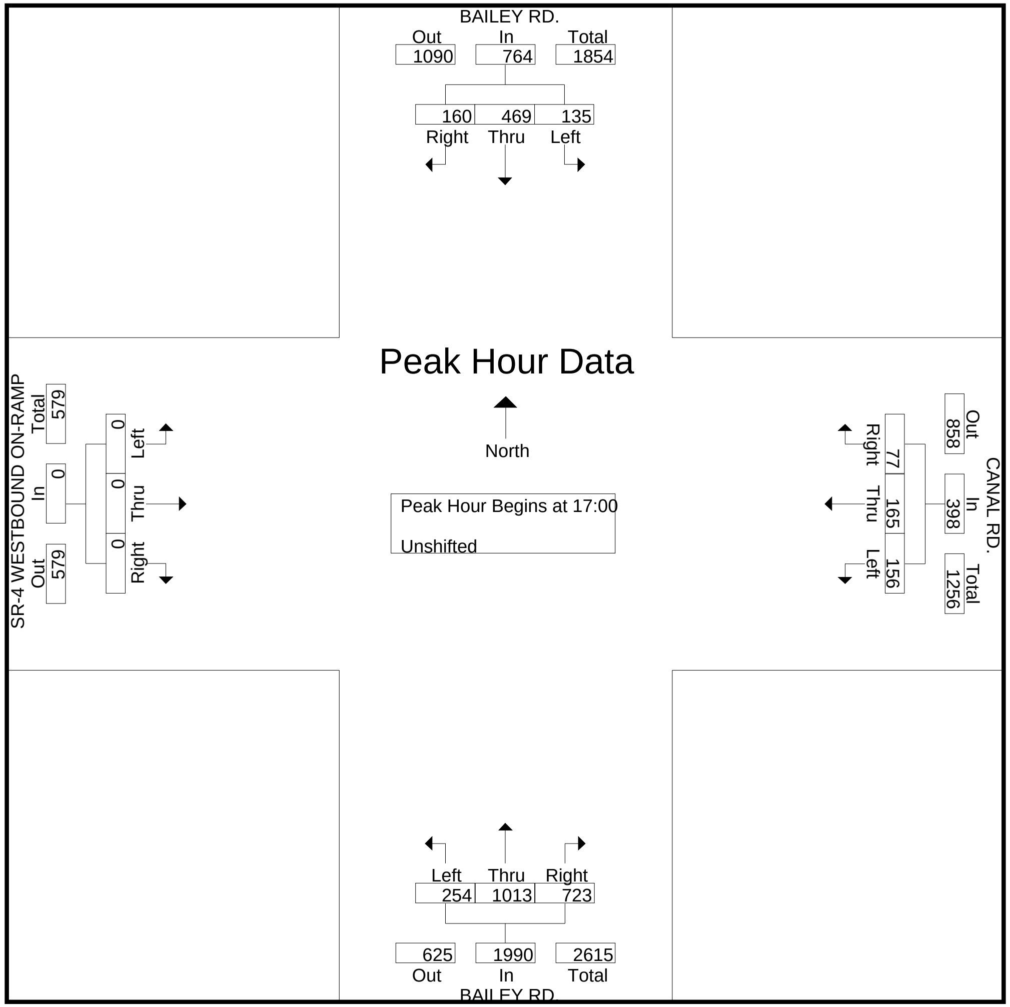

All Traffic Data

(916) 771-8700

PITTSBURG

File Name : 10-7481-013 BAILEY-EB RAMPS
Site Code : 00000000
Start Date : 11/18/2010
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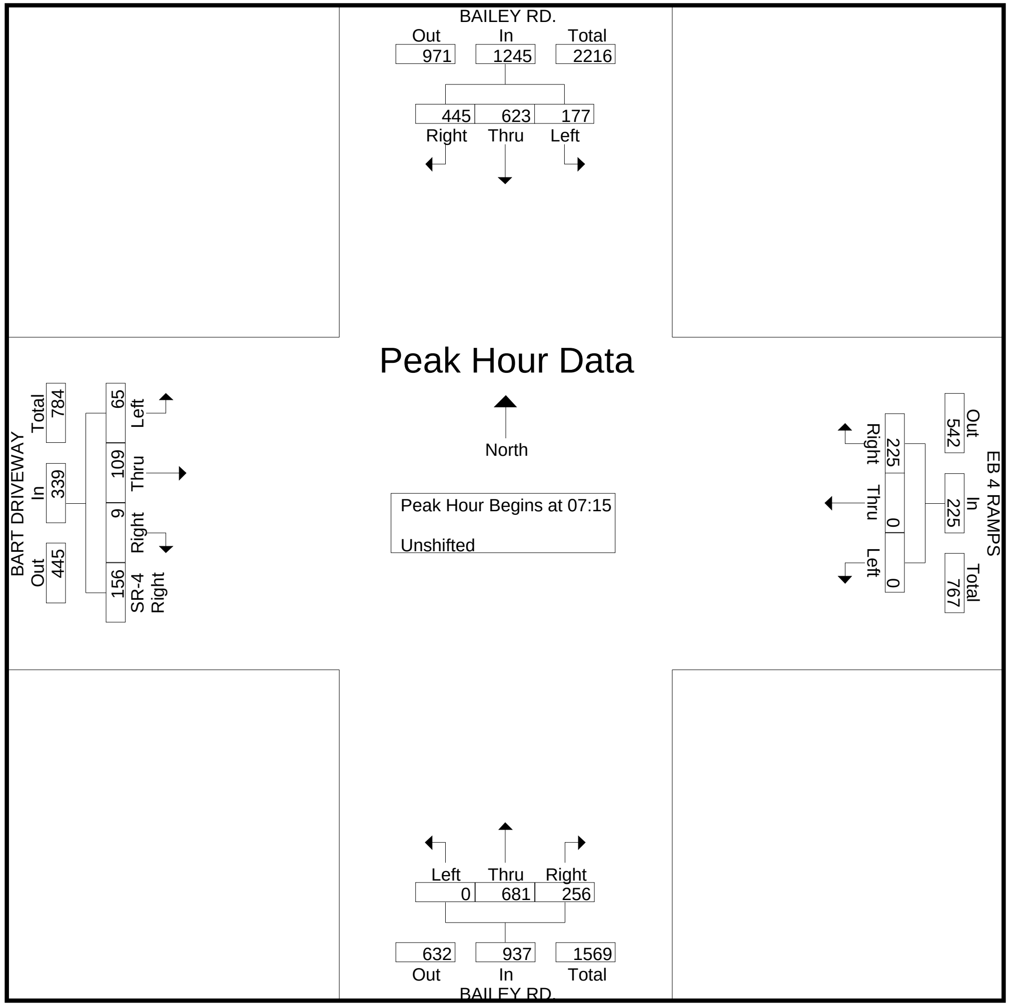
Groups Printed- Unshifted

	BAILEY RD. Southbound				EB 4 RAMPS Westbound				BAILEY RD. Northbound				BART DRIVEWAY Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	SR-4 Right	App. Total	Int. Total
07:00	26	92	78	196	0	0	48	48	0	167	50	217	6	12	1	30	49	510
07:15	27	141	136	304	0	0	56	56	0	160	56	216	29	25	3	32	89	665
07:30	43	158	108	309	0	0	46	46	0	192	76	268	11	28	2	51	92	715
07:45	59	171	108	338	0	0	67	67	0	169	72	241	12	28	3	34	77	723
Total	155	562	430	1147	0	0	217	217	0	688	254	942	58	93	9	147	307	2613
08:00	48	153	93	294	0	0	56	56	0	160	52	212	13	28	1	39	81	643
08:15	67	115	56	238	0	0	36	36	0	160	47	207	15	25	4	36	80	561
08:30	48	84	50	182	0	0	41	41	0	142	64	206	9	22	2	34	67	496
08:45	45	85	27	157	0	0	51	51	0	129	40	169	4	24	2	25	55	432
Total	208	437	226	871	0	0	184	184	0	591	203	794	41	99	9	134	283	2132
16:00	29	161	25	215	0	0	152	152	0	170	37	207	11	31	1	124	167	741
16:15	32	113	42	187	0	0	185	185	0	159	24	183	18	48	2	123	191	746
16:30	32	146	39	217	0	0	211	211	0	178	25	203	19	41	2	138	200	831
16:45	27	159	45	231	0	0	261	261	0	166	32	198	25	44	3	128	200	890
Total	120	579	151	850	0	0	809	809	0	673	118	791	73	164	8	513	758	3208
17:00	29	166	44	239	0	0	246	246	0	168	31	199	23	49	4	129	205	889
17:15	25	161	59	245	0	0	208	208	0	220	28	248	27	56	2	137	222	923
17:30	37	159	69	265	0	0	198	198	0	185	16	201	23	37	2	120	182	846
17:45	38	142	63	243	0	0	192	192	0	186	23	209	38	43	1	147	229	873
Total	129	628	235	992	0	0	844	844	0	759	98	857	111	185	9	533	838	3531
Grand Total	612	2206	1042	3860	0	0	2054	2054	0	2711	673	3384	283	541	35	1327	2186	11484
Apprch %	15.9	57.2	27		0	0	100		0	80.1	19.9		12.9	24.7	1.6	60.7		
Total %	5.3	19.2	9.1	33.6	0	0	17.9	17.9	0	23.6	5.9	29.5	2.5	4.7	0.3	11.6	19	

	BAILEY RD. Southbound				EB 4 RAMPS Westbound				BAILEY RD. Northbound				BART DRIVEWAY Eastbound					
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	SR-4 Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																		
Peak Hour for Entire Intersection Begins at 07:15																		
07:15	27	141	**136**	304	0	0	56	56	0	160	56	216	**29**	25	**3**	32	89	665
07:30	43	158	108	309	0	0	46	46	0	**192**	**76**	**268**	11	**28**	2	**51**	**92**	715
07:45	**59**	**171**	108	**338**	0	0	**67**	**67**	0	169	72	241	12	28	3	34	77	**723**
08:00	48	153	93	294	0	0	56	56	0	160	52	212	13	28	1	39	81	643
Total Volume	177	623	445	1245	0	0	225	225	0	681	256	937	65	109	9	156	339	2746
% App. Total	14.2	50	35.7		0	0	100		0	72.7	27.3		19.2	32.2	2.7	46		



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:45

16:45	27	159	45	231	0	0	**261**	**261**	0	166	**32**	198	25	44	3	128	200	890
17:00	29	**166**	44	239	0	0	246	246	0	168	31	199	23	49	**4**	129	205	889
17:15	25	161	59	245	0	0	208	208	0	**220**	28	**248**	**27**	**56**	2	**137**	**222**	**923**
17:30	**37**	159	**69**	**265**	0	0	198	198	0	185	16	201	23	37	2	120	182	846
Total Volume	118	645	217	980	0	0	913	913	0	739	107	846	98	186	11	514	809	3548
% App. Total	12	65.8	22.1		0	0	100		0	87.4	12.6		12.1	23	1.4	63.5		
PHF	.797	.971	.786	.925	.000	.000	.875	.875	.000	.840	.836	.853	.907	.830	.688	.938	.911	.961

All Traffic Data

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File Name : 10-7481-013 BAILEY-EB RAMPS
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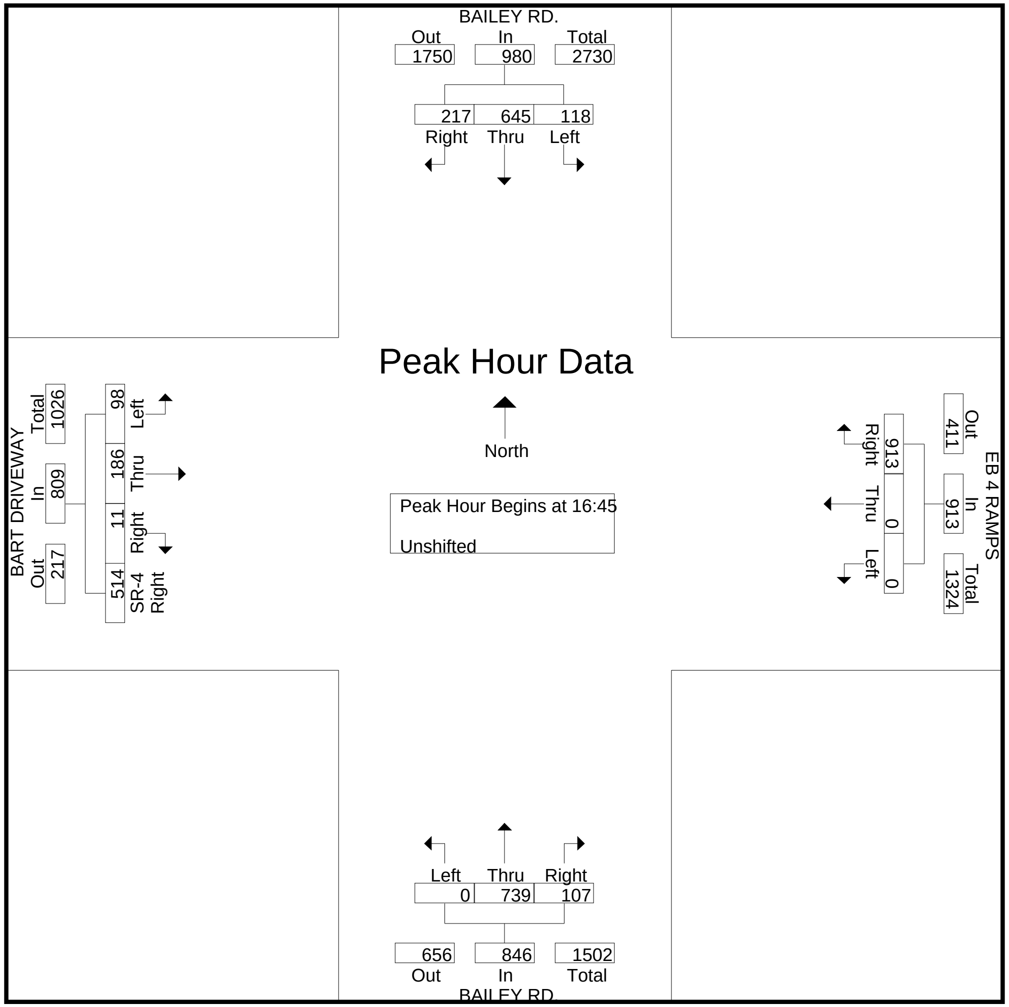

All Traffic Data

(916) 771-8700

PITTSBURG

File Name : 10-7481-014 BAILEY-MAYLARD
Site Code : 00000000
Start Date : 11/18/2010
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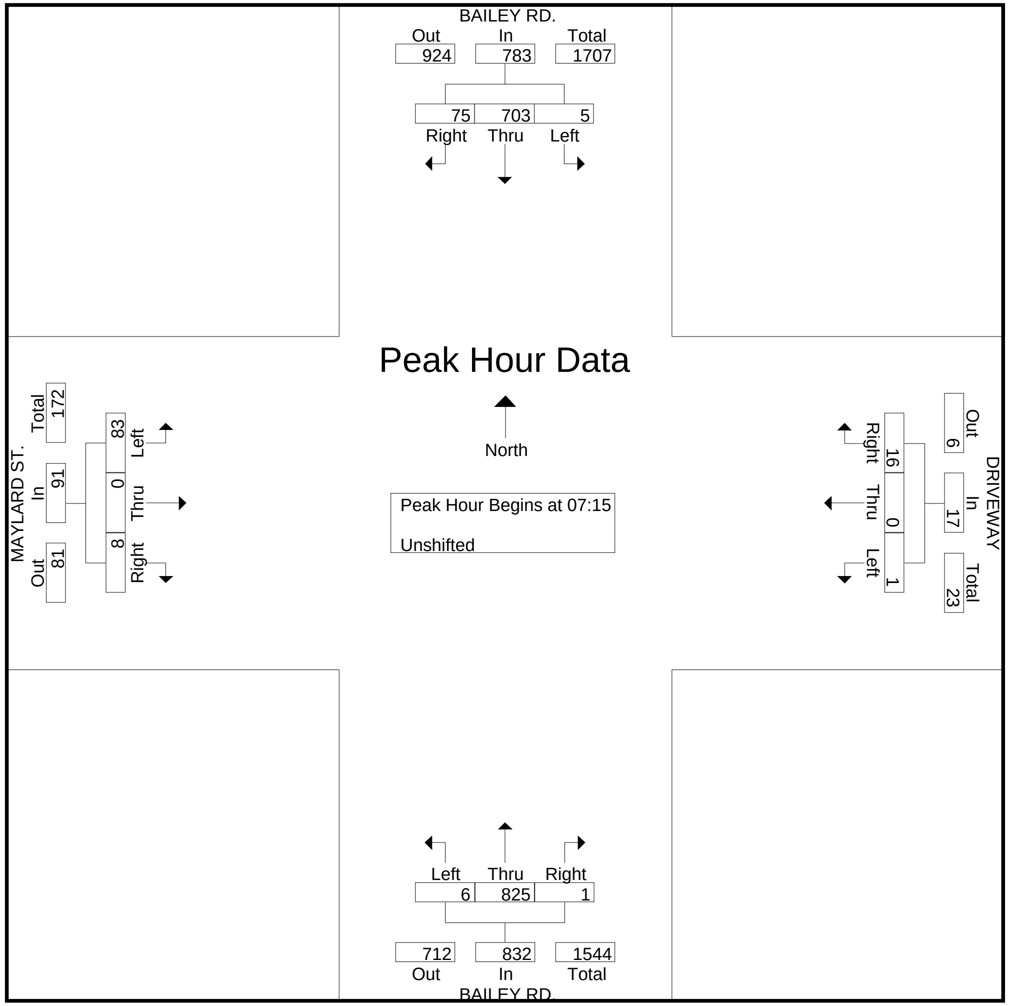
Groups Printed- Unshifted

	BAILEY RD. Southbound				DRIVEWAY Westbound				BAILEY RD. Northbound				MAYLARD ST. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	0	118	15	133	0	0	3	3	3	190	0	193	15	0	2	17	346
07:15	0	162	14	176	1	0	2	3	1	192	0	193	21	0	2	23	395
07:30	2	174	17	193	0	0	4	4	0	234	1	235	19	0	2	21	453
07:45	1	194	19	214	0	0	7	7	3	227	0	230	17	0	2	19	470
Total	3	648	65	716	1	0	16	17	7	843	1	851	72	0	8	80	1664
08:00	2	173	25	200	0	0	3	3	2	172	0	174	26	0	2	28	405
08:15	1	130	22	153	0	0	6	6	6	177	0	183	31	0	9	40	382
08:30	1	87	21	109	0	0	2	2	6	161	1	168	33	0	5	38	317
08:45	0	86	15	101	0	0	2	2	0	134	0	134	29	0	2	31	268
Total	4	476	83	563	0	0	13	13	14	644	1	659	119	0	18	137	1372
16:00	3	203	48	254	0	0	2	2	6	126	0	132	70	0	24	94	482
16:15	1	205	43	249	0	0	3	3	5	119	0	124	70	0	19	89	465
16:30	4	230	53	287	0	0	4	4	8	130	0	138	69	0	18	87	516
16:45	0	271	32	303	0	1	1	2	5	125	0	130	67	0	17	84	519
Total	8	909	176	1093	0	1	10	11	24	500	0	524	276	0	78	354	1982
17:00	1	254	41	296	0	0	1	1	4	129	0	133	75	0	18	93	523
17:15	0	265	45	310	0	0	1	1	3	167	0	170	65	0	18	83	564
17:30	0	242	34	276	0	0	0	0	6	132	0	138	60	0	20	80	494
17:45	1	233	37	271	0	1	1	2	7	120	0	127	80	0	19	99	499
Total	2	994	157	1153	0	1	3	4	20	548	0	568	280	0	75	355	2080
Grand Total	17	3027	481	3525	1	2	42	45	65	2535	2	2602	747	0	179	926	7098
Apprch %	0.5	85.9	13.6		2.2	4.4	93.3		2.5	97.4	0.1		80.7	0	19.3		
Total %	0.2	42.6	6.8	49.7	0	0	0.6	0.6	0.9	35.7	0	36.7	10.5	0	2.5	13	

	BAILEY RD. Southbound				DRIVEWAY Westbound				BAILEY RD. Northbound				MAYLARD ST. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15																	
07:15	0	162	14	176	**1**	0	2	3	1	192	0	193	21	0	**2**	23	395
07:30	**2**	174	17	193	0	0	4	4	0	**234**	**1**	**235**	19	0	2	21	453
07:45	1	**194**	19	**214**	0	0	**7**	**7**	**3**	227	0	230	17	0	2	19	**470**
08:00	2	173	**25**	200	0	0	3	3	2	172	0	174	**26**	0	2	**28**	405
Total Volume	5	703	75	783	1	0	16	17	6	825	1	832	83	0	8	91	1723

PHF	.625	.906	.750	.915	.250	.000	.571	.607	.500	.881	.250	.885	.798	.000	1.000	.813	.916



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:30

16:30	**4**	230	**53**	287	0	0	**4**	**4**	**8**	130	0	138	69	0	**18**	87	516
16:45	0	**271**	32	303	0	**1**	1	2	5	125	0	130	67	0	17	84	519
17:00	1	254	41	296	0	0	1	1	4	129	0	133	**75**	0	18	**93**	523
17:15	0	265	45	**310**	0	0	1	1	3	**167**	0	**170**	65	0	18	83	**564**
Total Volume	5	1020	171	1196	0	1	7	8	20	551	0	571	276	0	71	347	2122
% App. Total	0.4	85.3	14.3		0	12.5	87.5		3.5	96.5	0		79.5	0	20.5		
PHF	.313	.941	.807	.965	.000	.250	.438	.500	.625	.825	.000	.840	.920	.000	.986	.933	.941

All Traffic Data

(916) 771-8700

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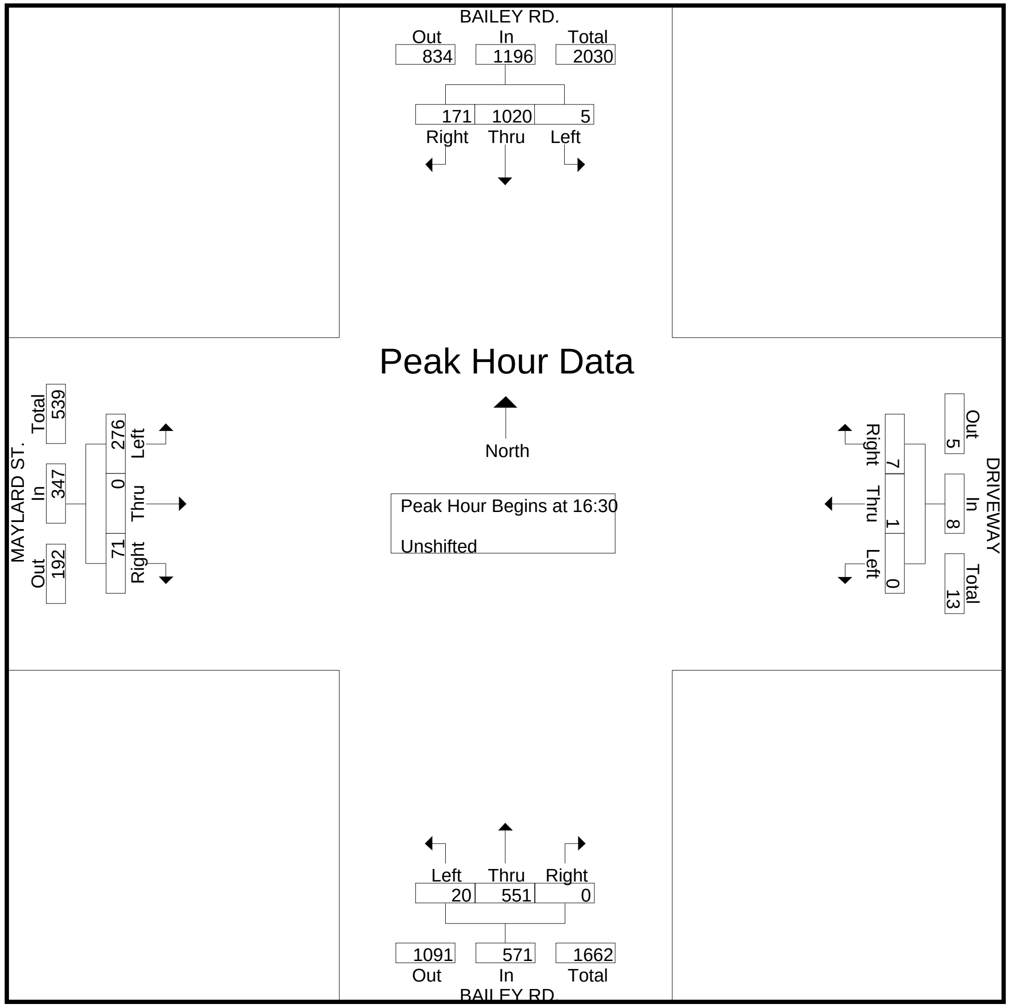

All Traffic Data

(916) 771-8700

PITTSBURG

File Name : 10-7481-015 BAILEY-LELAND
Site Code : 00000000
Start Date : 11/18/2010
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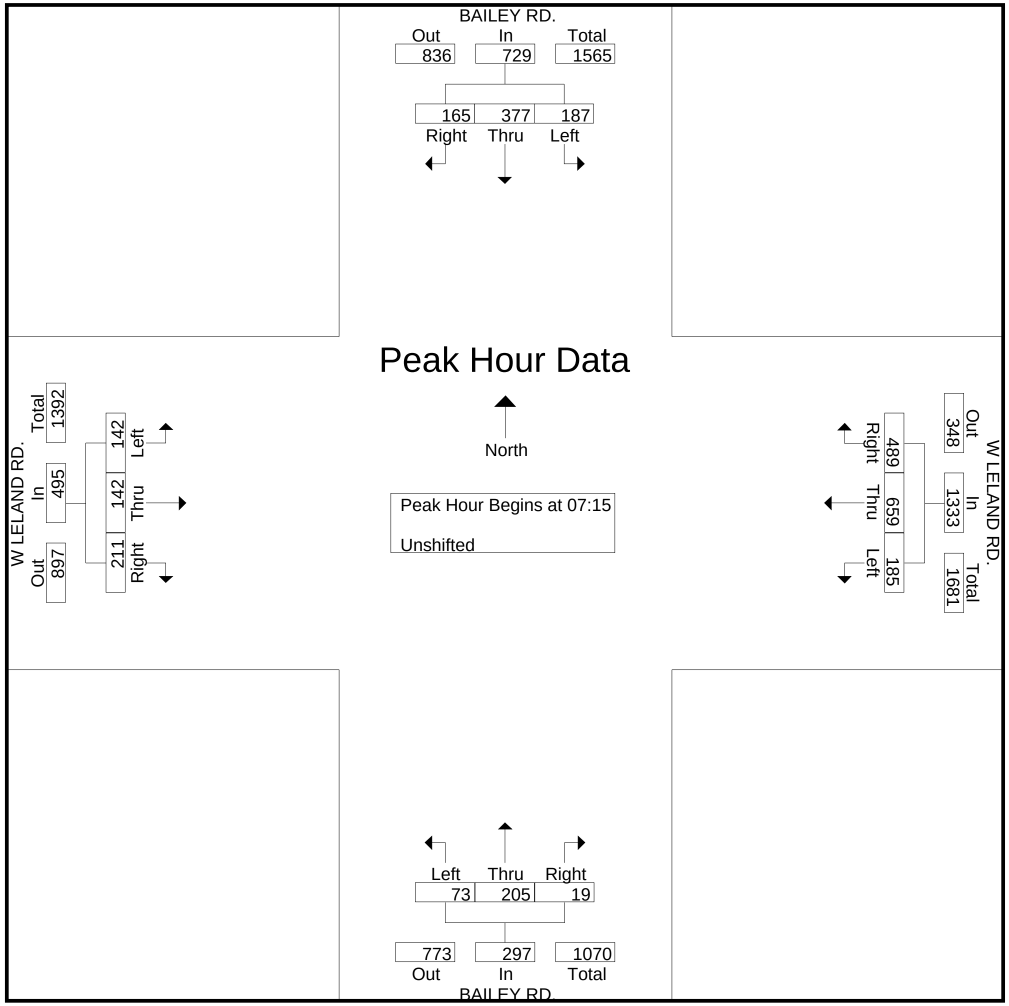
Groups Printed- Unshifted

	BAILEY RD. Southbound				W LELAND RD. Westbound				BAILEY RD. Northbound				W LELAND RD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	20	65	25	110	36	172	132	340	13	39	1	53	24	26	36	86	589
07:15	33	98	37	168	53	180	125	358	13	35	1	49	35	22	63	120	695
07:30	34	120	34	188	64	204	136	404	16	64	6	86	35	36	74	145	823
07:45	48	87	55	190	38	162	120	320	20	64	7	91	40	37	45	122	723
Total	135	370	151	656	191	718	513	1422	62	202	15	279	134	121	218	473	2830
08:00	72	72	39	183	30	113	108	251	24	42	5	71	32	47	29	108	613
08:15	48	56	35	139	24	75	116	215	26	44	2	72	29	34	34	97	523
08:30	40	34	16	90	15	66	100	181	8	31	7	46	28	29	12	69	386
08:45	35	40	12	87	8	30	79	117	8	27	6	41	33	25	15	73	318
Total	195	202	102	499	77	284	403	764	66	144	20	230	122	135	90	347	1840
16:00	143	43	33	219	4	34	65	103	22	41	31	94	26	100	15	141	557
16:15	176	30	30	236	7	27	56	90	25	40	23	88	32	100	13	145	559
16:30	173	32	33	238	5	38	69	112	20	40	25	85	28	127	14	169	604
16:45	200	49	47	296	14	46	59	119	25	44	18	87	25	169	10	204	706
Total	692	154	143	989	30	145	249	424	92	165	97	354	111	496	52	659	2426
17:00	185	45	51	281	9	46	72	127	27	44	32	103	23	159	13	195	706
17:15	178	58	39	275	7	64	77	148	33	67	32	132	30	194	20	244	799
17:30	191	45	36	272	5	52	68	125	30	41	25	96	27	188	12	227	720
17:45	196	27	36	259	5	47	55	107	25	44	21	90	27	186	6	219	675
Total	750	175	162	1087	26	209	272	507	115	196	110	421	107	727	51	885	2900
Grand Total	1772	901	558	3231	324	1356	1437	3117	335	707	242	1284	474	1479	411	2364	9996
Apprch %	54.8	27.9	17.3		10.4	43.5	46.1		26.1	55.1	18.8		20.1	62.6	17.4		
Total %	17.7	9	5.6	32.3	3.2	13.6	14.4	31.2	3.4	7.1	2.4	12.8	4.7	14.8	4.1	23.6	

	BAILEY RD. Southbound				W LELAND RD. Westbound				BAILEY RD. Northbound				W LELAND RD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15																	
07:15	33	98	37	168	53	180	125	358	13	35	1	49	35	22	63	120	695
07:30	34	**120**	34	188	**64**	**204**	**136**	**404**	16	**64**	6	86	35	36	**74**	**145**	**823**
07:45	48	87	**55**	**190**	38	162	120	320	20	64	**7**	**91**	**40**	37	45	122	723
08:00	**72**	72	39	183	30	113	108	251	**24**	42	5	71	32	**47**	29	108	613
Total Volume	187	377	165	729	185	659	489	1333	73	205	19	297	142	142	211	495	2854

PHF	.649	.785	.750	.959	.723	.808	.899	.825	.760	.801	.679	.816	.888	.755	.713	.853	.867



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:45

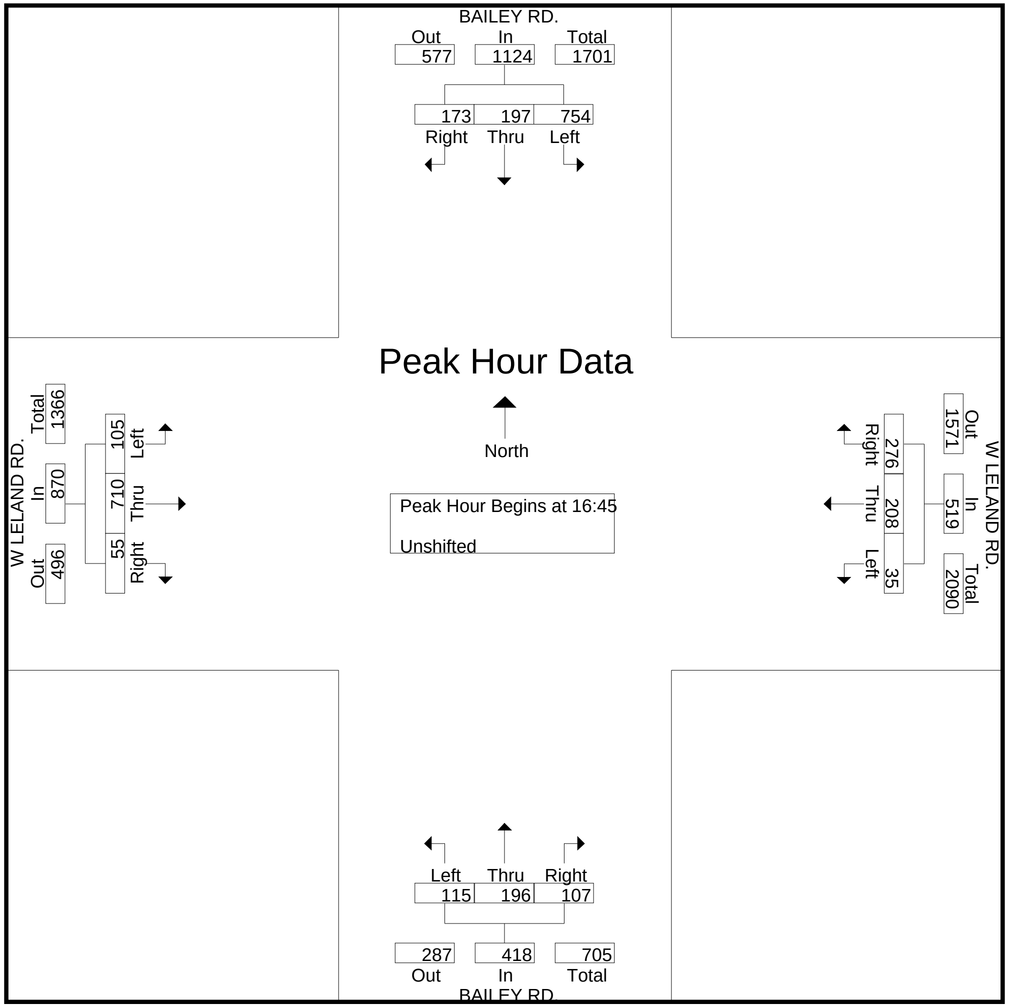
16:45	**200**	49	47	**296**	**14**	46	59	119	25	44	18	87	25	169	10	204	706
17:00	185	45	**51**	281	9	46	72	127	27	44	**32**	103	23	159	13	195	706
17:15	178	**58**	39	275	7	**64**	**77**	**148**	**33**	**67**	32	**132**	**30**	**194**	**20**	**244**	**799**
17:30	191	45	36	272	5	52	68	125	30	41	25	96	27	188	12	227	720
Total Volume	754	197	173	1124	35	208	276	519	115	196	107	418	105	710	55	870	2931
% App. Total	67.1	17.5	15.4		6.7	40.1	53.2		27.5	46.9	25.6		12.1	81.6	6.3		
PHF	.943	.849	.848	.949	.625	.813	.896	.877	.871	.731	.836	.792	.875	.915	.688	.891	.917

All Traffic Data

(916) 771-8700

PITTSBURG

File Name : 10-7481-015 BAILEY-LELAND
Site Code : 00000000
Start Date : 11/18/2010
Page No : 3



All Traffic Data

(916) 771-8700

PITTSBURG

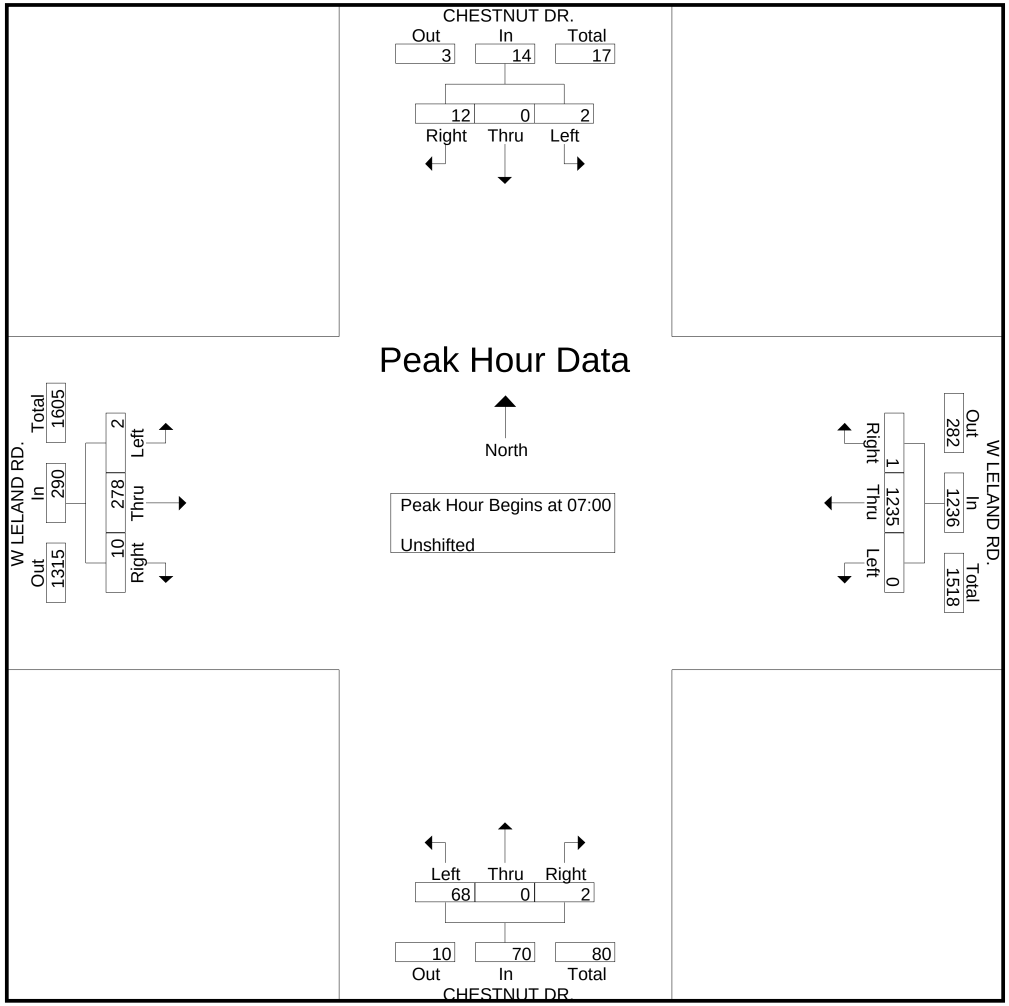
File Name : 10-7481-016 CHESTNUT-LELAND
Site Code : 00000000
Start Date : 11/17/2010
Page No : 1

Groups Printed- Unshifted

	CHESTNUT DR. Southbound				W LELAND RD. Westbound				CHESTNUT DR. Northbound				W LELAND RD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	0	0	5	5	0	299	1	300	15	0	0	15	1	45	3	49	369
07:15	1	0	4	5	0	300	0	300	11	0	0	11	0	60	3	63	379
07:30	0	0	1	1	0	350	0	350	22	0	1	23	0	86	2	88	462
07:45	1	0	2	3	0	286	0	286	20	0	1	21	1	87	2	90	400
Total	2	0	12	14	0	1235	1	1236	68	0	2	70	2	278	10	290	1610
08:00	0	0	0	0	0	226	0	226	3	0	0	3	0	124	7	131	360
08:15	0	1	1	2	2	194	0	196	6	0	3	9	0	106	4	110	317
08:30	0	0	1	1	1	156	0	157	4	0	3	7	0	62	0	62	227
08:45	1	0	1	2	2	129	0	131	4	0	0	4	0	62	3	65	202
Total	1	1	3	5	5	705	0	710	17	0	6	23	0	354	14	368	1106
16:00	2	0	1	3	2	118	0	120	9	0	1	10	3	296	4	303	436
16:15	2	0	2	4	0	99	0	99	1	0	1	2	2	247	10	259	364
16:30	1	0	1	2	0	116	2	118	3	0	1	4	1	350	6	357	481
16:45	2	0	3	5	1	128	0	129	4	0	0	4	3	299	3	305	443
Total	7	0	7	14	3	461	2	466	17	0	3	20	9	1192	23	1224	1724
17:00	0	0	2	2	1	115	0	116	4	0	1	5	2	361	12	375	498
17:15	0	0	0	0	1	143	1	145	6	0	0	6	3	383	7	393	544
17:30	0	0	1	1	0	108	1	109	4	0	1	5	0	368	6	374	489
17:45	1	0	0	1	1	123	1	125	3	0	3	6	1	429	12	442	574
Total	1	0	3	4	3	489	3	495	17	0	5	22	6	1541	37	1584	2105
Grand Total	11	1	25	37	11	2890	6	2907	119	0	16	135	17	3365	84	3466	6545
Apprch %	29.7	2.7	67.6		0.4	99.4	0.2		88.1	0	11.9		0.5	97.1	2.4		
Total %	0.2	0	0.4	0.6	0.2	44.2	0.1	44.4	1.8	0	0.2	2.1	0.3	51.4	1.3	53	

	CHESTNUT DR. Southbound				W LELAND RD. Westbound				CHESTNUT DR. Northbound				W LELAND RD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	0	0	**5**	**5**	0	299	**1**	300	15	0	0	15	**1**	45	**3**	49	369
07:15	**1**	0	4	5	0	300	0	300	11	0	0	11	0	60	3	63	379
07:30	0	0	1	1	0	**350**	0	**350**	**22**	0	**1**	**23**	0	86	2	88	**462**
07:45	1	0	2	3	0	286	0	286	20	0	1	21	1	**87**	2	**90**	400
Total Volume	2	0	12	14	0	1235	1	1236	68	0	2	70	2	278	10	290	1610

PHF	.500	.000	.600	.700	.000	.882	.250	.883	.773	.000	.500	.761	.500	.799	.833	.806	.871



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 17:00

17:00	0	0	**2**	**2**	**1**	115	0	116	4	0	1	5	2	361	**12**	375	498
17:15	0	0	0	0	1	**143**	**1**	**145**	**6**	0	0	**6**	**3**	383	7	393	544
17:30	0	0	1	1	0	108	1	109	4	0	1	5	0	368	6	374	489
17:45	**1**	0	0	1	1	123	1	125	3	0	**3**	6	1	**429**	12	**442**	**574**
Total Volume	1	0	3	4	3	489	3	495	17	0	5	22	6	1541	37	1584	2105
% App. Total	25	0	75		0.6	98.8	0.6		77.3	0	22.7		0.4	97.3	2.3		
PHF	.250	.000	.375	.500	.750	.855	.750	.853	.708	.000	.417	.917	.500	.898	.771	.896	.917

All Traffic Data

(916) 771-8700

PITTSBURG

File Name : 10-7481-016 CHESTNUT-LELAND
Site Code : 00000000
Start Date : 11/17/2010
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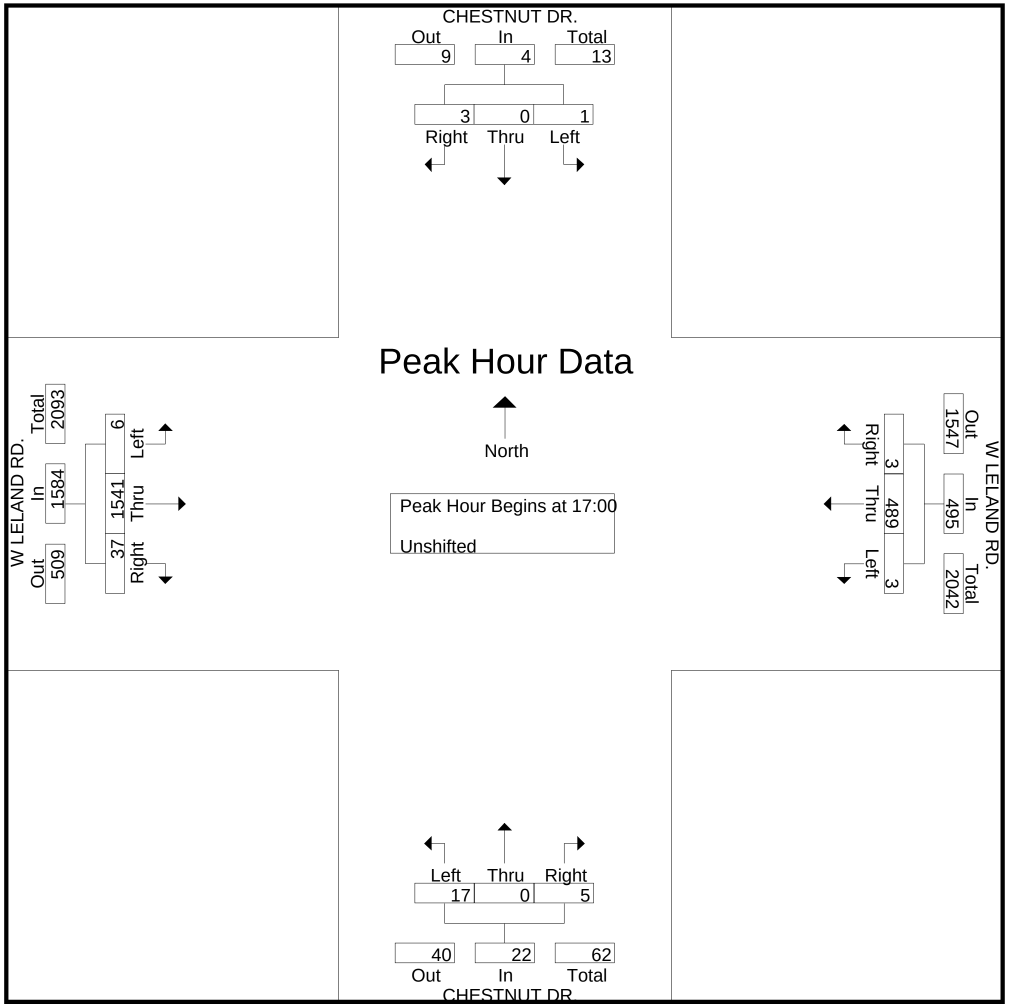


All Traffic Data

(916) 771-8700

CONCORD

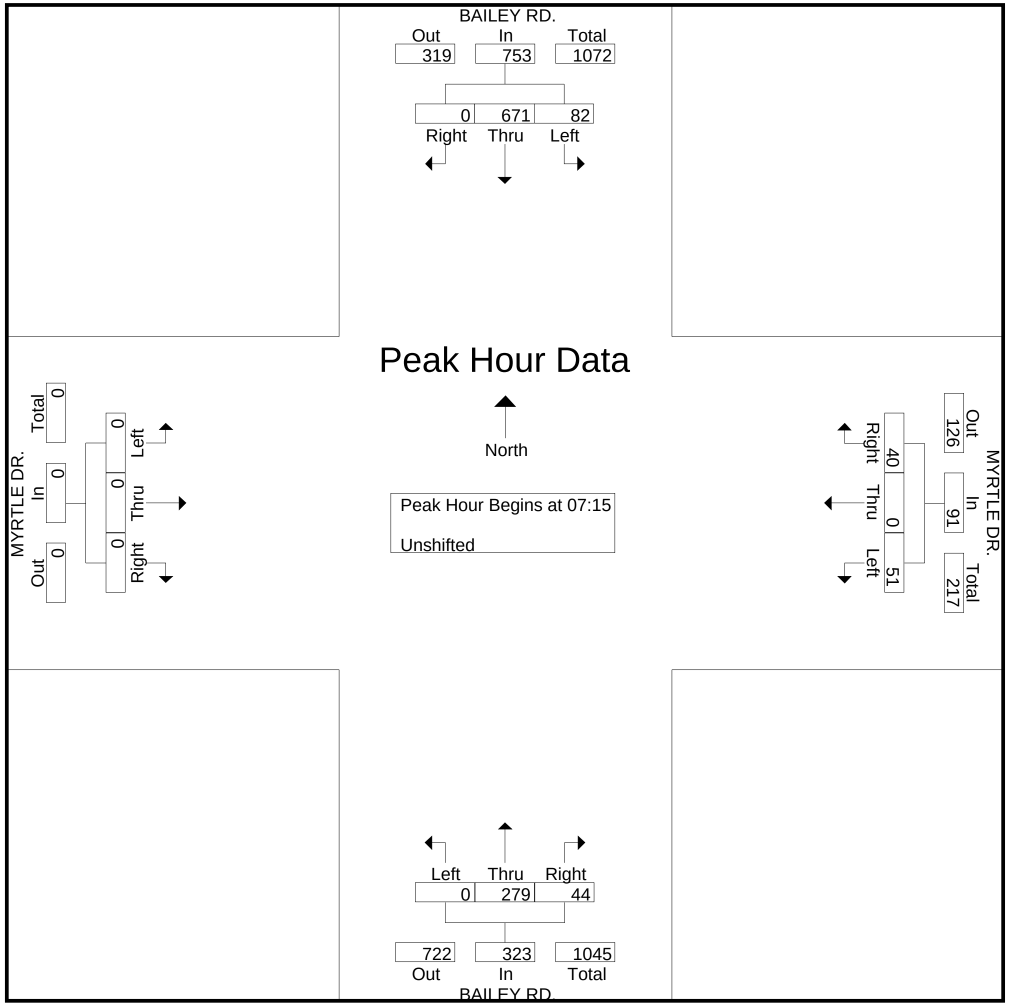
File Name : 10-7481-018 BAILEY-MYRTLE
Site Code : 00000000
Start Date : 11/18/2010
Page No : 1

Groups Printed- Unshifted

	BAILEY RD. Southbound				MYRTLE DR. Westbound				BAILEY RD. Northbound				MYRTLE DR. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	6	102	0	108	4	0	4	8	0	35	2	37	0	0	0	0	153
07:15	18	164	0	182	8	0	5	13	0	66	7	73	0	0	0	0	268
07:30	36	212	0	248	11	0	15	26	0	67	16	83	0	0	0	0	357
07:45	22	173	0	195	14	0	15	29	0	70	13	83	0	0	0	0	307
Total	82	651	0	733	37	0	39	76	0	238	38	276	0	0	0	0	1085
08:00	6	122	0	128	18	0	5	23	0	76	8	84	0	0	0	0	235
08:15	5	111	0	116	15	0	9	24	0	60	6	66	0	0	0	0	206
08:30	3	62	0	65	5	0	4	9	0	31	7	38	0	0	0	0	112
08:45	2	49	0	51	7	0	4	11	0	26	13	39	0	0	0	0	101
Total	16	344	0	360	45	0	22	67	0	193	34	227	0	0	0	0	654
16:00	8	54	0	62	4	0	8	12	0	76	7	83	0	0	0	0	157
16:15	6	39	0	45	5	0	4	9	0	80	11	91	0	0	0	0	145
16:30	5	44	0	49	8	0	9	17	0	67	16	83	0	0	0	0	149
16:45	11	52	0	63	5	0	6	11	0	87	15	102	0	0	0	0	176
Total	30	189	0	219	22	0	27	49	0	310	49	359	0	0	0	0	627
17:00	9	42	0	51	1	0	16	17	0	92	12	104	0	0	0	0	172
17:15	8	62	0	70	4	0	13	17	0	88	19	107	0	0	0	0	194
17:30	9	43	0	52	4	0	10	14	0	98	12	110	0	0	0	0	176
17:45	3	40	0	43	2	0	2	4	0	74	11	85	0	0	0	0	132
Total	29	187	0	216	11	0	41	52	0	352	54	406	0	0	0	0	674
Grand Total	157	1371	0	1528	115	0	129	244	0	1093	175	1268	0	0	0	0	3040
Apprch %	10.3	89.7	0		47.1	0	52.9		0	86.2	13.8		0	0	0		
Total %	5.2	45.1	0	50.3	3.8	0	4.2	8	0	36	5.8	41.7	0	0	0	0	

	BAILEY RD. Southbound				MYRTLE DR. Westbound				BAILEY RD. Northbound				MYRTLE DR. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15																	
07:15	18	164	0	182	8	0	5	13	0	66	7	73	0	0	0	0	268
07:30	**36**	**212**	0	**248**	11	0	**15**	26	0	67	**16**	83	0	0	0	0	**357**
07:45	22	173	0	195	14	0	15	**29**	0	70	13	83	0	0	0	0	307
08:00	6	122	0	128	**18**	0	5	23	0	**76**	8	**84**	0	0	0	0	235
Total Volume	82	671	0	753	51	0	40	91	0	279	44	323	0	0	0	0	1167

PHF	.569	.791	.000	.759	.708	.000	.667	.784	.000	.918	.688	.961	.000	.000	.000	.000	.817



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:45

16:45	**11**	52	0	63	**5**	0	6	11	0	87	15	102	0	0	0	0	176
17:00	9	42	0	51	1	0	**16**	**17**	0	92	12	104	0	0	0	0	172
17:15	8	**62**	0	**70**	4	0	13	17	0	88	**19**	107	0	0	0	0	**194**
17:30	9	43	0	52	4	0	10	14	0	**98**	12	**110**	0	0	0	0	176
Total Volume	37	199	0	236	14	0	45	59	0	365	58	423	0	0	0	0	718
% App. Total	15.7	84.3	0		23.7	0	76.3		0	86.3	13.7		0	0	0		
PHF	.841	.802	.000	.843	.700	.000	.703	.868	.000	.931	.763	.961	.000	.000	.000	.000	.925

All Traffic Data

(916) 771-8700

CONCORD

File Name : 10-7481-018 BAILEY-MYRTLE
Site Code : 00000000
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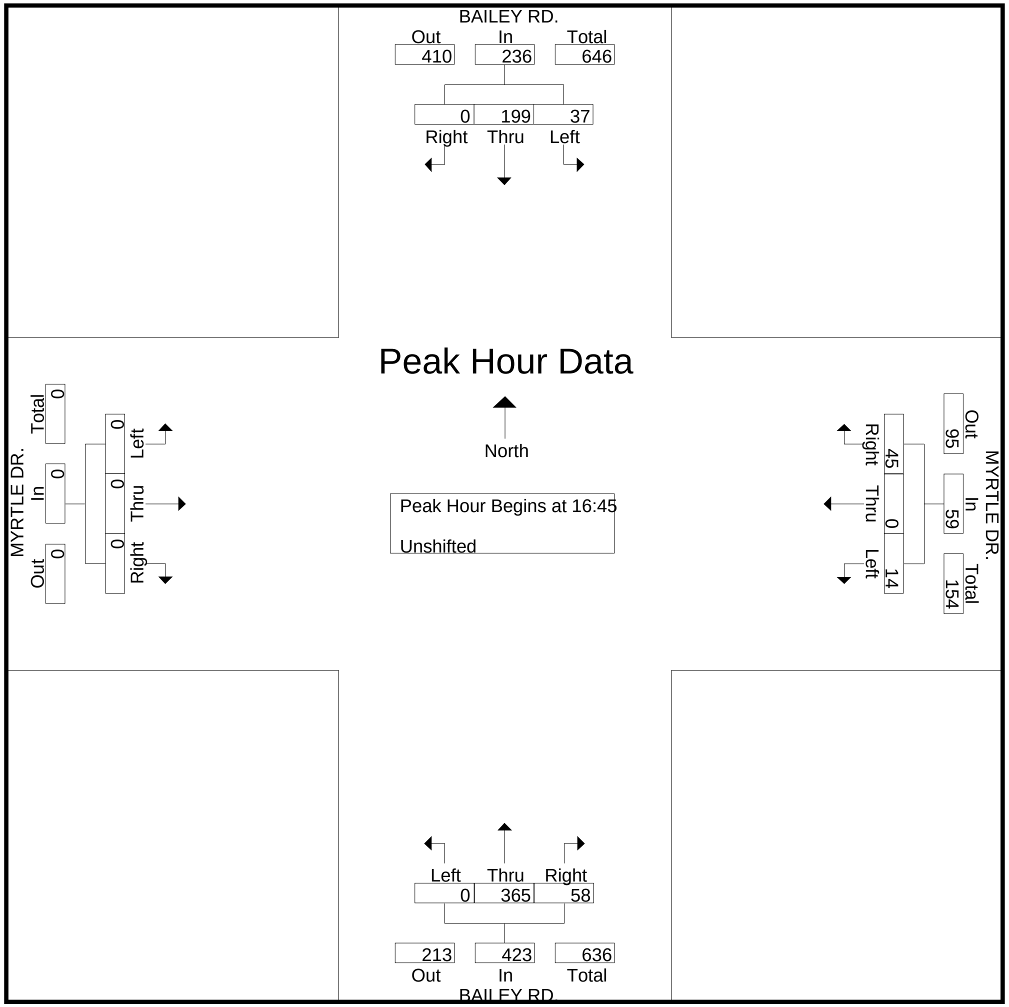


All Traffic Data

(916) 771-8700

CONCORD

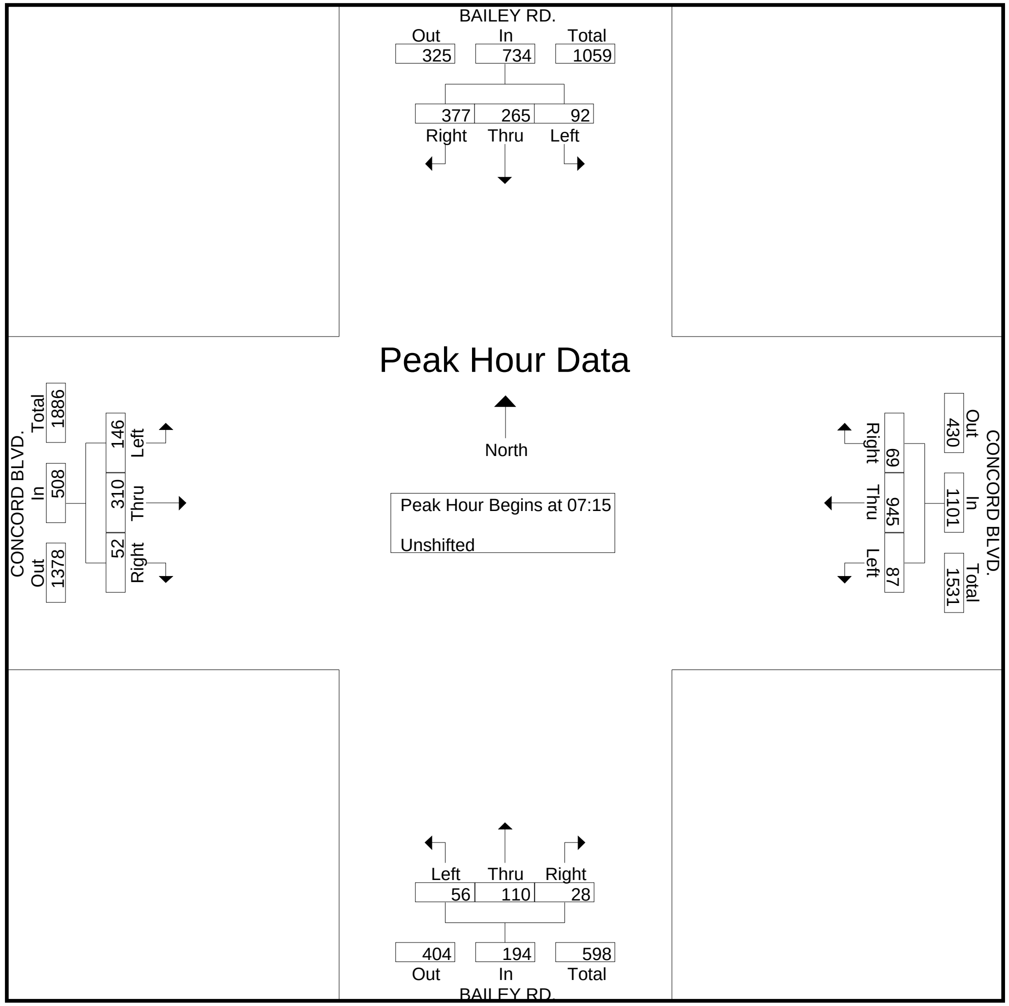
File Name : 10-7481-019 BAILEY-CONCORD
Site Code : 00000000
Start Date : 11/18/2010
Page No : 1

Groups Printed- Unshifted

	BAILEY RD. Southbound				CONCORD BLVD. Westbound				BAILEY RD. Northbound				CONCORD BLVD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00	15	49	49	113	6	180	7	193	18	18	5	41	14	29	12	55	402
07:15	18	67	83	168	20	227	17	264	13	33	7	53	18	63	10	91	576
07:30	33	77	125	235	27	265	13	305	12	22	3	37	50	57	7	114	691
07:45	20	65	106	191	25	244	18	287	20	28	5	53	42	71	17	130	661
Total	86	258	363	707	78	916	55	1049	63	101	20	184	124	220	46	390	2330
08:00	21	56	63	140	15	209	21	245	11	27	13	51	36	119	18	173	609
08:15	24	63	49	136	16	157	27	200	9	24	8	41	24	112	12	148	525
08:30	19	39	21	79	17	137	11	165	7	15	7	29	12	84	12	108	381
08:45	16	26	17	59	12	124	2	138	4	23	1	28	13	54	6	73	298
Total	80	184	150	414	60	627	61	748	31	89	29	149	85	369	48	502	1813
16:00	7	36	15	58	10	79	14	103	6	38	14	58	35	173	25	233	452
16:15	9	24	16	49	9	88	18	115	10	55	12	77	21	186	18	225	466
16:30	12	26	14	52	7	78	15	100	13	43	11	67	30	133	19	182	401
16:45	14	33	15	62	10	72	19	101	12	51	10	73	42	214	23	279	515
Total	42	119	60	221	36	317	66	419	41	187	47	275	128	706	85	919	1834
17:00	10	26	13	49	7	74	25	106	10	43	13	66	43	203	19	265	486
17:15	14	36	15	65	9	115	18	142	10	47	15	72	44	236	14	294	573
17:30	8	33	13	54	8	75	21	104	17	55	16	88	39	230	28	297	543
17:45	6	28	10	44	6	73	15	94	20	53	13	86	30	202	20	252	476
Total	38	123	51	212	30	337	79	446	57	198	57	312	156	871	81	1108	2078
Grand Total	246	684	624	1554	204	2197	261	2662	192	575	153	920	493	2166	260	2919	8055
Apprch %	15.8	44	40.2		7.7	82.5	9.8		20.9	62.5	16.6		16.9	74.2	8.9		
Total %	3.1	8.5	7.7	19.3	2.5	27.3	3.2	33	2.4	7.1	1.9	11.4	6.1	26.9	3.2	36.2	

	BAILEY RD. Southbound				CONCORD BLVD. Westbound				BAILEY RD. Northbound				CONCORD BLVD. Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15																	
07:15	18	67	83	168	20	227	17	264	13	**33**	7	**53**	18	63	10	91	576
07:30	**33**	**77**	**125**	**235**	**27**	**265**	13	**305**	12	22	3	37	**50**	57	7	114	**691**
07:45	20	65	106	191	25	244	18	287	**20**	28	5	53	42	71	17	130	661
08:00	21	56	63	140	15	209	**21**	245	11	27	**13**	51	36	**119**	**18**	**173**	609
Total Volume	92	265	377	734	87	945	69	1101	56	110	28	194	146	310	52	508	2537

PHF	.697	.860	.754	.781	.806	.892	.821	.902	.700	.833	.538	.915	.730	.651	.722	.734	.918



Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 16:45

16:45	**14**	33	**15**	62	**10**	72	19	101	12	51	10	73	42	214	23	279	515
17:00	10	26	13	49	7	74	**25**	106	10	43	13	66	43	203	19	265	486
17:15	14	**36**	15	**65**	9	**115**	18	**142**	10	47	15	72	**44**	**236**	14	294	**573**
17:30	8	33	13	54	8	75	21	104	**17**	**55**	**16**	**88**	39	230	**28**	**297**	543
Total Volume	46	128	56	230	34	336	83	453	49	196	54	299	168	883	84	1135	2117
% App. Total	20	55.7	24.3		7.5	74.2	18.3		16.4	65.6	18.1		14.8	77.8	7.4		
PHF	.821	.889	.933	.885	.850	.730	.830	.798	.721	.891	.844	.849	.955	.935	.750	.955	.924

All Traffic Data

(916) 771-8700

CONCORD

File Name : 10-7481-019 BAILEY-CONCORD
Site Code : 00000000
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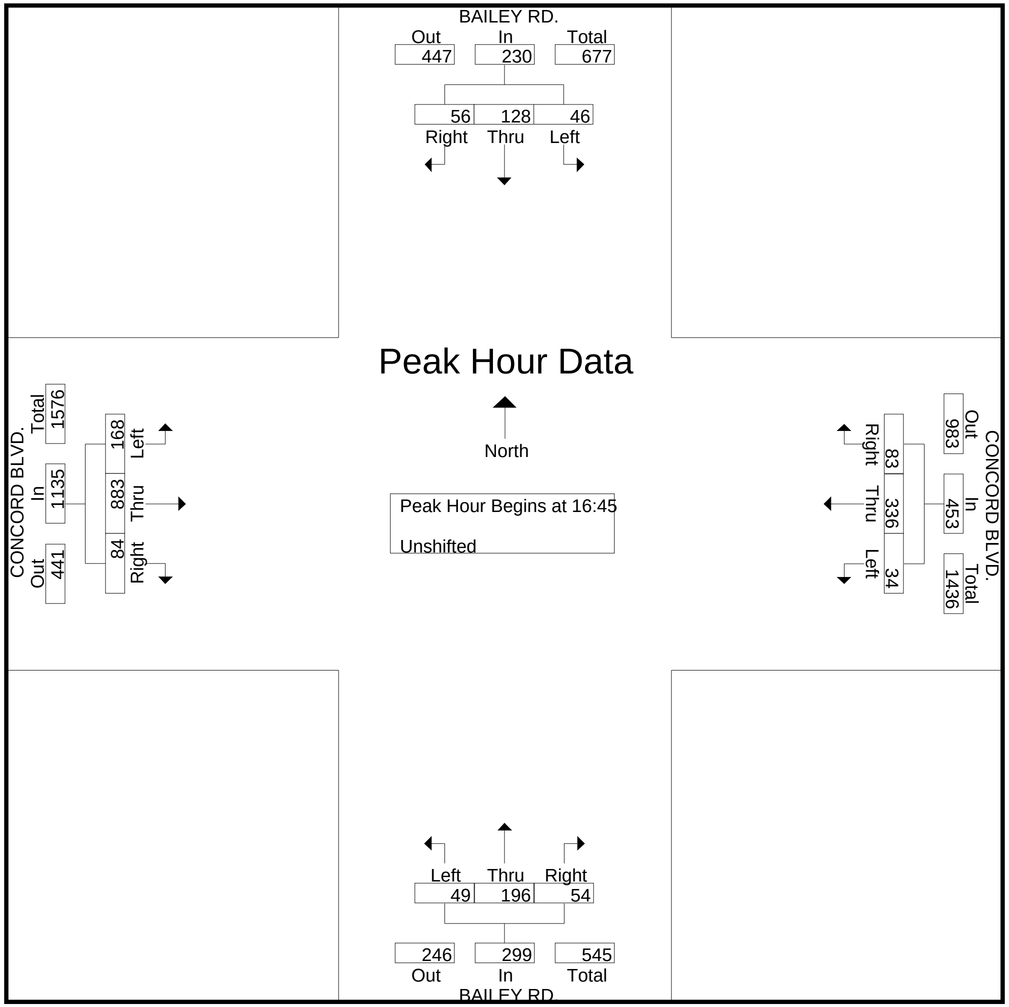

APPENDIX B:
EXISTING PEDESTRIAN AND BICYCLE COUNTS

PREPARED BY ALL TRAFFIC DATA

PROJECT#: 11-7028-001
N/S Street: Bailey Road
E/W Street: SR-4 EB Off Ramp / Bart Access
DATE: 1/12/2011 DAY: Wednesday
CITY: Pittsburg

A M

PEDESTRIANS

T I M E	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:15 AM			1	0	0	0	0	0
7:30 AM			0	0	0	0	0	1
7:45 AM			0	0	1	0	0	2
8:00 AM			0	0	0	0	0	0
TOTALS	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**3**

BIKES

T I M E	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:15 AM			1	0	0	0	2	4
7:30 AM			1	0	2	0	3	2
7:45 AM			0	0	0	0	0	1
8:00 AM			0	0	0	0	1	1
TOTALS	**0**	**0**	**2**	**0**	**2**	**0**	**6**	**8**

P M

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
5:00 PM			0	0	0	0	0	4
5:15 PM			0	0	0	1	3	0
5:30 PM			0	0	0	0	2	1
5:45 PM			0	0	1	0	0	1
TOTALS	**0**	**0**	**0**	**0**	**1**	**1**	**5**	**6**

BIKES

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
5:00 PM			0	0	0	1	1	1
5:15 PM			0	1	0	2	2	2
5:30 PM			0	0	0	0	3	2
5:45 PM			0	0	2	0	1	2
TOTALS	**0**	**0**	**0**	**1**	**2**	**3**	**7**	**7**

PREPARED BY ALL TRAFFIC DATA

PROJECT#: 11-7028-002
N/S Street: Bailey Road
E/W Street: West Leland Road
DATE: 1/12/2011 DAY: Wednesday
CITY: Pittsburg

A M

PEDESTRIANS

T I M E	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:15 AM	2	0	1	2	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	2	1	0	1	0
8:00 AM	0	0	0	3	0	0	0	0
TOTALS	**2**	**0**	**1**	**7**	**1**	**0**	**1**	**0**

BIKES

T I M E	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:15 AM	0	1	0	0	0	0	0	0
7:30 AM	0	0	0	1	0	0	0	0
7:45 AM	0	0	1	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0
TOTALS	**0**	**1**	**1**	**1**	**0**	**0**	**0**	**0**

P M

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
5:00 PM	0	0	4	0	0	1	0	0
5:15 PM	0	0	0	1	0	0	1	0
5:30 PM	1	0	1	0	1	1	0	0
5:45 PM	0	0	0	0	0	0	0	0
TOTALS	**1**	**0**	**5**	**1**	**1**	**2**	**1**	**0**

BIKES

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
5:00 PM	1	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0
5:30 PM	0	1	0	0	0	0	0	0
5:45 PM	0	1	0	0	0	0	0	0
TOTALS	**1**	**2**	**0**	**0**	**0**	**0**	**0**	**0**

PREPARED BY ALL TRAFFIC DATA

PROJECT#: 11-7028-003
N/S Street: Bart Entrance
E/W Street: West Leland Road
DATE: 1/12/2011 DAY: Wednesday
CITY: Pittsburg

A M

PEDESTRIANS

T I M E	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:15 AM	1	4			5	0		
7:30 AM	0	6			8	1		
7:45 AM	0	3			4	0		
8:00 AM	1	4			5	1		
TOTALS	**2**	**17**	**0**	**0**	**22**	**2**	**0**	**0**

BIKES

T I M E	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:15 AM	0	0			0	0		
7:30 AM	0	1			0	0		
7:45 AM	0	0			1	0		
8:00 AM	0	0			0	1		
TOTALS	**0**	**1**	**0**	**0**	**1**	**1**	**0**	**0**

P M

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
5:00 PM	1	0			2	0		
5:15 PM	1	0			1	3		
5:30 PM	0	1			0	1		
5:45 PM	2	0			0	8		
TOTALS	**4**	**1**	**0**	**0**	**3**	**12**	**0**	**0**

BIKES

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
5:00 PM	0	1			0	0		
5:15 PM	0	0			0	1		
5:30 PM	0	1			0	0		
5:45 PM	0	0			0	0		
TOTALS	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**

PREPARED BY ALL TRAFFIC DATA

PROJECT#: 11-7028-004
N/S Street: Bart Exit
E/W Street: West Leland Road
DATE: 1/12/2011 DAY: Wednesday
CITY: Pittsburg

A M

PEDESTRIANS

T I M E	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:15 AM	0	0			2	1		
7:30 AM	0	0			1	1		
7:45 AM	0	1			2	1		
8:00 AM	0	0			1	0		
TOTALS	**0**	**1**	**0**	**0**	**6**	**3**	**0**	**0**

BIKES

T I M E	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
7:15 AM	0	0			0	0		
7:30 AM	0	1			0	0		
7:45 AM	0	0			0	0		
8:00 AM	0	0			0	0		
TOTALS	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**

P M

PEDESTRIANS

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
5:00 PM	1	0			0	5		
5:15 PM	3	0			0	8		
5:30 PM	0	0			1	3		
5:45 PM	4	2			0	3		
TOTALS	**8**	**2**	**0**	**0**	**1**	**19**	**0**	**0**

BIKES

TIME	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG	
	EB	WB	EB	WB	NB	SB	NB	SB
5:00 PM	0	1			0	0		
5:15 PM	0	0			0	0		
5:30 PM	0	1			0	1		
5:45 PM	0	0			0	0		
TOTALS	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**

APPENDIX C:
EXISTING LEVEL OF SERVICE CALCULATION SHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	312	0	150	0	0	0	0	1189	75	0	294	221
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5		3.5					5.0			5.0	4.0
Lane Util. Factor	0.97		1.00					0.91			0.95	1.00
Frt	1.00		0.85					0.99			1.00	0.85
Flt Protected	0.95		1.00					1.00			1.00	1.00
Satd. Flow (prot)	3433		1583					5040			3539	1583
Flt Permitted	0.95		1.00					1.00			1.00	1.00
Satd. Flow (perm)	3433		1583					5040			3539	1583
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	355	0	170	0	0	0	0	1351	85	0	334	251
RTOR Reduction (vph)	0	0	128	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	355	0	42	0	0	0	0	1436	0	0	334	251
Turn Type	Prot		custom									Free
Protected Phases	4		4					2			6	
Permitted Phases												Free
Actuated Green, G (s)	11.9		11.9					27.3			27.3	47.7
Effective Green, g (s)	11.9		11.9					27.3			27.3	47.7
Actuated g/C Ratio	0.25		0.25					0.57			0.57	1.00
Clearance Time (s)	3.5		3.5					5.0			5.0	
Vehicle Extension (s)	4.0		4.0					4.0			4.0	
Lane Grp Cap (vph)	856		395					2885			2025	1583
v/s Ratio Prot	c0.10		0.03					c0.28			0.09	
v/s Ratio Perm												0.16
v/c Ratio	0.41		0.11					0.50			0.16	0.16
Uniform Delay, d1	15.0		13.8					6.1			4.8	0.0
Progression Factor	1.00		1.00					1.00			1.00	1.00
Incremental Delay, d2	0.4		0.2					0.2			0.1	0.2
Delay (s)	15.4		14.0					6.3			4.9	0.2
Level of Service	B		B					A			A	A
Approach Delay (s)		15.0			0.0			6.3			2.9	
Approach LOS		B			A			A			A	

Intersection Summary			
HCM Average Control Delay	7.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	47.7	Sum of lost time (s)	8.5
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	84	24	16	189	21	793	10	393	139	204	223	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	6.0		5.5	6.0	6.0	5.5	7.0		5.5	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	0.97	0.95		0.97	0.95	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3323		1770	3539	1583	3433	3400		3433	3501	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3323		1770	3539	1583	3433	3400		3433	3501	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	102	29	20	230	26	967	12	479	170	249	272	21
RTOR Reduction (vph)	0	18	0	0	0	766	0	26	0	0	3	0
Lane Group Flow (vph)	102	31	0	230	26	201	12	623	0	249	290	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	11.3	9.5		21.6	19.8	19.8	1.1	31.2		12.8	42.9	
Effective Green, g (s)	11.3	9.5		21.6	19.8	19.8	1.1	31.2		12.8	42.9	
Actuated g/C Ratio	0.11	0.10		0.22	0.20	0.20	0.01	0.31		0.13	0.43	
Clearance Time (s)	5.5	6.0		5.5	6.0	6.0	5.5	7.0		5.5	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	4.5		3.0	4.5	
Lane Grp Cap (vph)	202	319		386	707	316	38	1070		443	1516	
v/s Ratio Prot	0.06	0.01		c0.13	0.01		0.00	c0.18		c0.07	0.08	
v/s Ratio Perm						c0.13						
v/c Ratio	0.50	0.10		0.60	0.04	0.64	0.32	0.58		0.56	0.19	
Uniform Delay, d1	41.3	40.9		34.8	32.0	36.4	48.6	28.5		40.5	17.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	0.1		2.5	0.0	4.2	4.7	1.1		1.6	0.1	
Delay (s)	43.3	41.0		37.3	32.0	40.5	53.4	29.6		42.2	17.5	
Level of Service	D	D		D	C	D	D	C		D	B	
Approach Delay (s)		42.5			39.7			30.0			28.8	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	35.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	99.1	Sum of lost time (s)	24.0
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	342	16	10	915	0	64	0	20	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	5.0	6.0		5.0		5.0			
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00		1.00			
Frt	1.00	1.00	0.85	1.00	1.00		1.00		0.85			
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (prot)	1770	3539	1583	1770	3539		1770		1583			
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (perm)	1770	3539	1583	1770	3539		1770		1583			
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	1	438	21	13	1173	0	82	0	26	0	0	0
RTOR Reduction (vph)	0	0	9	0	0	0	0	0	23	0	0	0
Lane Group Flow (vph)	1	438	12	13	1173	0	82	0	3	0	0	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2						4			
Actuated Green, G (s)	1.3	34.4	34.4	1.3	34.4		6.6		6.6			
Effective Green, g (s)	1.3	34.4	34.4	1.3	34.4		6.6		6.6			
Actuated g/C Ratio	0.02	0.59	0.59	0.02	0.59		0.11		0.11			
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0		5.0		5.0			
Vehicle Extension (s)	3.0	2.0	2.0	3.0	2.0		3.0		3.0			
Lane Grp Cap (vph)	39	2088	934	39	2088		200		179			
v/s Ratio Prot	0.00	0.12		c0.01	c0.33		c0.05					
v/s Ratio Perm			0.01						0.00			
v/c Ratio	0.03	0.21	0.01	0.33	0.56		0.41		0.02			
Uniform Delay, d1	27.9	5.6	4.9	28.1	7.3		24.0		23.0			
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00		1.00			
Incremental Delay, d2	0.3	0.0	0.0	5.0	0.2		1.4		0.0			
Delay (s)	28.1	5.6	4.9	33.1	7.5		25.4		23.0			
Level of Service	C	A	A	C	A		C		C			
Approach Delay (s)		5.6			7.8			24.8			0.0	
Approach LOS		A			A			C			A	

Intersection Summary			
HCM Average Control Delay	8.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	58.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	307	57	20	756	164	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		5.0	6.0	5.0	5.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3456		1770	3539	1770	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3456		1770	3539	1770	1583
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	384	71	25	945	205	52
RTOR Reduction (vph)	19	0	0	0	0	41
Lane Group Flow (vph)	436	0	25	945	205	11
Turn Type			Prot			Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	23.0		1.2	29.2	10.6	10.6
Effective Green, g (s)	23.0		1.2	29.2	10.6	10.6
Actuated g/C Ratio	0.45		0.02	0.57	0.21	0.21
Clearance Time (s)	6.0		5.0	6.0	5.0	5.0
Vehicle Extension (s)	4.0		3.0	4.0	3.0	3.0
Lane Grp Cap (vph)	1565		42	2034	369	330
v/s Ratio Prot	0.13		0.01	c0.27	c0.12	
v/s Ratio Perm						0.01
v/c Ratio	0.28		0.60	0.46	0.56	0.03
Uniform Delay, d1	8.7		24.6	6.3	18.0	16.0
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1		20.6	0.2	1.8	0.0
Delay (s)	8.8		45.2	6.5	19.8	16.1
Level of Service	A		D	A	B	B
Approach Delay (s)	8.8			7.5	19.0	
Approach LOS	A			A	B	

Intersection Summary			
HCM Average Control Delay	9.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	50.8	Sum of lost time (s)	11.0
Intersection Capacity Utilization	39.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	307	44	37	619	154	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	0.98		1.00	1.00	0.94	
Flt Protected	1.00		0.95	1.00	0.97	
Satd. Flow (prot)	3473		1770	3539	1706	
Flt Permitted	1.00		0.95	1.00	0.97	
Satd. Flow (perm)	3473		1770	3539	1706	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	379	54	46	764	190	142
RTOR Reduction (vph)	13	0	0	0	39	0
Lane Group Flow (vph)	420	0	46	764	293	0
Turn Type			Prot			
Protected Phases	2		1		7	
Permitted Phases				6		
Actuated Green, G (s)	18.1		2.6	25.7	14.2	
Effective Green, g (s)	18.1		2.6	25.7	14.2	
Actuated g/C Ratio	0.36		0.05	0.52	0.28	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Vehicle Extension (s)	2.0		3.0	2.0	3.0	
Lane Grp Cap (vph)	1260		92	1823	485	
v/s Ratio Prot	0.12		0.03		c0.17	
v/s Ratio Perm				c0.22		
v/c Ratio	0.33		0.50	0.42	0.60	
Uniform Delay, d1	11.5		23.0	7.5	15.4	
Progression Factor	1.00		1.26	0.26	1.00	
Incremental Delay, d2	0.1		4.1	0.1	2.1	
Delay (s)	11.6		33.2	2.0	17.6	
Level of Service	B		C	A	B	
Approach Delay (s)	11.6			3.8	17.6	
Approach LOS	B			A	B	

Intersection Summary			
HCM Average Control Delay	8.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	49.9	Sum of lost time (s)	10.0
Intersection Capacity Utilization	43.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	422	622	0	46	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0	5.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frpb, ped/bikes		1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	3539		1770	1583
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	3539		1770	1583
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	0	515	759	0	56	41
RTOR Reduction (vph)	0	0	0	0	0	29
Lane Group Flow (vph)	0	515	759	0	56	12
Confl. Peds. (#/hr)					9	
Turn Type						Perm
Protected Phases		2	6		3	
Permitted Phases						3
Actuated Green, G (s)		18.1	25.7		14.2	14.2
Effective Green, g (s)		18.1	25.7		14.2	14.2
Actuated g/C Ratio		0.36	0.52		0.28	0.28
Clearance Time (s)		5.0	5.0		5.0	5.0
Vehicle Extension (s)		2.0	2.0		3.0	3.0
Lane Grp Cap (vph)		1284	1823		504	450
v/s Ratio Prot		0.15	c0.21		c0.03	
v/s Ratio Perm						0.01
v/c Ratio		0.40	0.42		0.11	0.03
Uniform Delay, d1		11.9	7.5		13.2	12.9
Progression Factor		0.55	1.00		1.00	1.00
Incremental Delay, d2		0.1	0.1		0.1	0.0
Delay (s)		6.6	7.5		13.3	12.9
Level of Service		A	A		B	B
Approach Delay (s)		6.6	7.5		13.1	
Approach LOS		A	A		B	

Intersection Summary			
HCM Average Control Delay	7.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	49.9	Sum of lost time (s)	10.0
Intersection Capacity Utilization	31.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	58	407	621	186	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0			
Lane Util. Factor	1.00	0.95	0.95			
Frpb, ped/bikes	1.00	1.00	0.99			
Flpb, ped/bikes	1.00	1.00	1.00			
Frt	1.00	1.00	0.97			
Flt Protected	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3539	3392			
Flt Permitted	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3539	3392			
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	68	479	731	219	0	0
RTOR Reduction (vph)	0	0	22	0	0	0
Lane Group Flow (vph)	68	479	928	0	0	0
Confl. Peds. (#/hr)				19		
Confl. Bikes (#/hr)				1		
Turn Type	Prot					
Protected Phases	1	6	2			
Permitted Phases						
Actuated Green, G (s)	4.2	41.8	32.6			
Effective Green, g (s)	4.2	41.8	32.6			
Actuated g/C Ratio	0.07	0.73	0.57			
Clearance Time (s)	5.0	5.0	5.0			
Vehicle Extension (s)	3.0	2.0	2.0			
Lane Grp Cap (vph)	129	2568	1920			
v/s Ratio Prot	c0.04	0.14	c0.27			
v/s Ratio Perm						
v/c Ratio	0.53	0.19	0.48			
Uniform Delay, d1	25.7	2.5	7.5			
Progression Factor	1.00	1.00	1.00			
Incremental Delay, d2	3.9	0.0	0.1			
Delay (s)	29.6	2.5	7.5			
Level of Service	C	A	A			
Approach Delay (s)		5.9	7.5		0.0	
Approach LOS		A	A		A	

Intersection Summary			
HCM Average Control Delay	6.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	57.6	Sum of lost time (s)	20.8
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	383	22	67	737	58	141
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	473	27	83	910	72	174
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	444			676		
pX, platoon unblocked					0.85	
vC, conflicting volume			500		1107	250
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			500		780	250
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		73	77
cM capacity (veh/h)			1060		261	750

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	315	185	83	455	455	246
Volume Left	0	0	83	0	0	72
Volume Right	0	27	0	0	0	174
cSH	1700	1700	1060	1700	1700	485
Volume to Capacity	0.19	0.11	0.08	0.27	0.27	0.51
Queue Length 95th (ft)	0	0	6	0	0	70
Control Delay (s)	0.0	0.0	8.7	0.0	0.0	19.8
Lane LOS			A			C
Approach Delay (s)	0.0		0.7			19.8
Approach LOS						C

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	38.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	230	197	244	827	0	301	0	197	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		4.0	5.0		4.0		4.0			
Lane Util. Factor		0.95		1.00	0.95		1.00		1.00			
Frt		0.93		1.00	1.00		1.00		0.85			
Flt Protected		1.00		0.95	1.00		0.95		1.00			
Satd. Flow (prot)		3294		1770	3539		1770		1583			
Flt Permitted		1.00		0.95	1.00		0.95		1.00			
Satd. Flow (perm)		3294		1770	3539		1770		1583			
Peak-hour factor, PHF	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Adj. Flow (vph)	0	242	207	257	871	0	317	0	207	0	0	0
RTOR Reduction (vph)	0	163	0	0	0	0	0	0	146	0	0	0
Lane Group Flow (vph)	0	286	0	257	871	0	317	0	61	0	0	0
Turn Type	Perm			Prot			Prot		custom			
Protected Phases		2		1	6		3					
Permitted Phases	2								3			
Actuated Green, G (s)		9.6		9.2	22.8		13.4		13.4			
Effective Green, g (s)		9.6		9.2	22.8		13.4		13.4			
Actuated g/C Ratio		0.21		0.20	0.50		0.30		0.30			
Clearance Time (s)		5.0		4.0	5.0		4.0		4.0			
Vehicle Extension (s)		3.0		3.0	3.0		3.0		3.0			
Lane Grp Cap (vph)		700		360	1785		525		469			
v/s Ratio Prot		0.09		c0.15	c0.25		c0.18					
v/s Ratio Perm									0.04			
v/c Ratio		0.41		0.71	0.49		0.60		0.13			
Uniform Delay, d1		15.4		16.8	7.4		13.6		11.6			
Progression Factor		1.00		1.00	1.00		1.00		1.00			
Incremental Delay, d2		0.4		6.6	0.2		2.0		0.1			
Delay (s)		15.7		23.3	7.6		15.6		11.8			
Level of Service		B		C	A		B		B			
Approach Delay (s)		15.7			11.2			14.1			0.0	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM Average Control Delay	12.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	45.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	253	327	124	462	501	211	120	465	199
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0		4.0	4.2		4.0	4.2	
Lane Util. Factor					0.95		0.97	0.91		1.00	0.95	
Frt					0.97		1.00	0.96		1.00	0.96	
Flt Protected					0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					3385		3433	4859		1770	3380	
Flt Permitted					0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)					3385		3433	4859		1770	3380	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	258	334	127	471	511	215	122	474	203
RTOR Reduction (vph)	0	0	0	0	0	0	0	55	0	0	26	0
Lane Group Flow (vph)	0	0	0	0	719	0	471	671	0	122	651	0
Turn Type				Split			Prot			Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)					33.1		23.5	72.5		12.2	61.2	
Effective Green, g (s)					33.1		23.5	72.5		12.2	61.2	
Actuated g/C Ratio					0.25		0.18	0.56		0.09	0.47	
Clearance Time (s)					4.0		4.0	4.2		4.0	4.2	
Vehicle Extension (s)					3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)					862		621	2710		166	1591	
v/s Ratio Prot					c0.21		c0.14	0.14		0.07	c0.19	
v/s Ratio Perm												
v/c Ratio					0.83		0.76	0.25		0.73	0.41	
Uniform Delay, d1					45.9		50.6	14.8		57.3	22.5	
Progression Factor					1.00		1.01	1.27		1.00	1.00	
Incremental Delay, d2					7.0		5.2	0.2		15.5	0.8	
Delay (s)					52.8		56.3	18.9		72.8	23.3	
Level of Service					D		E	B		E	C	
Approach Delay (s)		0.0			52.8			33.6			30.9	
Approach LOS		A			D			C			C	

Intersection Summary			
HCM Average Control Delay	37.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	109	165	0	0	225	0	681	256	177	623	445
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0			3.5		3.5	3.5	3.0	3.5	4.0
Lane Util. Factor		0.95	1.00			1.00		0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	1.00			1.00		1.00	0.99	1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85			0.86		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00			1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3475	1576			1611		3539	1560	3433	3539	1541
Flt Permitted		0.98	1.00			1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3475	1576			1611		3539	1560	3433	3539	1541
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	68	115	174	0	0	237	0	717	269	186	656	468
RTOR Reduction (vph)	0	0	122	0	0	56	0	0	91	0	0	0
Lane Group Flow (vph)	0	183	52	0	0	181	0	717	178	186	656	468
Confl. Peds. (#/hr)			1			1			1			3
Confl. Bikes (#/hr)			2			2			2			14
Turn Type	Split		custom			custom			custom	Prot		Free
Protected Phases	4!	4	5			2 6 4!		2 11!		1	6 11	
Permitted Phases			4						2			Free
Actuated Green, G (s)		12.5	38.5			102.1		95.7	71.3	12.3	78.5	130.0
Effective Green, g (s)		12.5	38.5			99.1		95.7	71.3	12.3	78.5	130.0
Actuated g/C Ratio		0.10	0.30			0.76		0.74	0.55	0.09	0.60	1.00
Clearance Time (s)		3.0	3.0						3.5	3.0		
Vehicle Extension (s)		3.0	3.0						5.0	3.0		
Lane Grp Cap (vph)		334	467			1228		2605	856	325	2137	1541
v/s Ratio Prot		c0.05	0.02			0.11		0.20		c0.05	0.19	
v/s Ratio Perm			0.01						0.11			c0.30
v/c Ratio		0.55	0.11			0.15		0.28	0.21	0.57	0.31	0.30
Uniform Delay, d1		56.1	33.3			4.1		5.7	15.0	56.3	12.5	0.0
Progression Factor		1.00	1.00			1.00		0.68	0.61	1.07	0.94	1.00
Incremental Delay, d2		1.8	0.1			0.1		0.1	0.5	2.4	0.1	0.5
Delay (s)		57.9	33.4			4.2		3.9	9.7	62.5	11.9	0.5
Level of Service		E	C			A		A	A	E	B	A
Approach Delay (s)		46.0			4.2			5.5			15.0	
Approach LOS		D			A			A			B	

Intersection Summary			
HCM Average Control Delay	14.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	83	0	8	1	0	16	6	825	1	5	703	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1	5.1		5.1		5.1	5.1		5.1	5.1	
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.91	
Frt	1.00	1.00	0.85		0.87		1.00	1.00		1.00	0.99	
Flt Protected	0.95	0.95	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1681	1583		1621		1770	3539		1770	5011	
Flt Permitted	0.95	0.95	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1681	1583		1621		1770	3539		1770	5011	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	0	9	1	0	17	7	897	1	5	764	82
RTOR Reduction (vph)	0	0	9	0	17	0	0	0	0	0	5	0
Lane Group Flow (vph)	45	45	0	0	1	0	7	898	0	5	841	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases			4									
Actuated Green, G (s)	6.8	6.8	6.8		2.4		1.2	98.6		1.8	99.2	
Effective Green, g (s)	6.8	6.8	6.8		2.4		1.2	98.6		1.8	99.2	
Actuated g/C Ratio	0.05	0.05	0.05		0.02		0.01	0.76		0.01	0.76	
Clearance Time (s)	5.1	5.1	5.1		5.1		5.1	5.1		5.1	5.1	
Vehicle Extension (s)	1.7	1.7	1.7		1.7		1.7	2.2		1.7	2.2	
Lane Grp Cap (vph)	88	88	83		30		16	2684		25	3824	
v/s Ratio Prot	c0.03	0.03			c0.00		0.00	c0.25		0.00	c0.17	
v/s Ratio Perm			0.00									
v/c Ratio	0.51	0.51	0.01		0.04		0.44	0.33		0.20	0.22	
Uniform Delay, d1	60.0	60.0	58.4		62.7		64.1	5.1		63.4	4.4	
Progression Factor	1.00	1.00	1.00		1.00		0.96	0.99		0.91	0.76	
Incremental Delay, d2	2.1	2.1	0.0		0.2		5.7	0.3		1.4	0.1	
Delay (s)	62.1	62.1	58.4		62.9		67.3	5.3		58.8	3.5	
Level of Service	E	E	E		E		E	A		E	A	
Approach Delay (s)		61.7			62.9			5.8			3.8	
Approach LOS		E			E			A			A	

Intersection Summary			
HCM Average Control Delay	8.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	142	142	211	185	659	489	73	205	19	187	377	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3142		1770	3539	1559	1770	3490		3433	1863	1562
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3142		1770	3539	1559	1770	3490		3433	1863	1562
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	163	163	243	213	757	562	84	236	22	215	433	190
RTOR Reduction (vph)	0	159	0	0	0	256	0	5	0	0	0	140
Lane Group Flow (vph)	163	247	0	213	757	306	84	253	0	215	433	50
Confl. Peds. (#/hr)			8			2			1			1
Confl. Bikes (#/hr)			2			1						
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	15.3	45.1		20.9	50.7	50.7	8.6	30.7		12.1	34.2	34.2
Effective Green, g (s)	15.3	45.1		20.9	50.7	50.7	8.6	30.7		12.1	34.2	34.2
Actuated g/C Ratio	0.12	0.35		0.16	0.39	0.39	0.07	0.24		0.09	0.26	0.26
Clearance Time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Vehicle Extension (s)	3.0	2.2		3.0	2.2	2.2	3.0	2.2		3.0	2.2	2.2
Lane Grp Cap (vph)	208	1090		285	1380	608	117	824		320	490	411
v/s Ratio Prot	0.09	0.08		c0.12	c0.21		0.05	0.07		c0.06	c0.23	
v/s Ratio Perm						0.20						0.03
v/c Ratio	0.78	0.23		0.75	0.55	0.50	0.72	0.31		0.67	0.88	0.12
Uniform Delay, d1	55.7	30.1		52.0	30.8	30.1	59.5	40.9		57.0	46.0	36.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.17	1.04	1.85
Incremental Delay, d2	17.3	0.5		10.2	1.6	3.0	18.9	0.1		5.4	16.6	0.1
Delay (s)	73.1	30.6		62.2	32.3	33.1	78.4	41.0		72.4	64.3	67.6
Level of Service	E	C		E	C	C	E	D		E	E	E
Approach Delay (s)		42.8			36.8			50.2			67.1	
Approach LOS		D			D			D			E	

Intersection Summary			
HCM Average Control Delay	46.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.7
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	357	14	0	1162	0	56	0	2	2	0	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0			5.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00		1.00	
Frt	1.00	0.99			1.00			1.00	0.85		0.89	
Flt Protected	0.95	1.00			1.00			0.95	1.00		0.99	
Satd. Flow (prot)	1770	3519			3539			1770	1583		1645	
Flt Permitted	0.95	1.00			1.00			0.75	1.00		0.94	
Satd. Flow (perm)	1770	3519			3539			1399	1583		1565	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	1	410	16	0	1336	0	64	0	2	2	0	8
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	2	0	7	0
Lane Group Flow (vph)	1	425	0	0	1336	0	0	64	0	0	3	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		
Actuated Green, G (s)	1.0	73.7			68.7			7.3	7.3		7.3	
Effective Green, g (s)	1.0	73.7			68.7			7.3	7.3		7.3	
Actuated g/C Ratio	0.01	0.82			0.76			0.08	0.08		0.08	
Clearance Time (s)	4.0	5.0			5.0			4.0	4.0		4.0	
Vehicle Extension (s)	1.5	2.5			2.5			1.5	1.5		1.5	
Lane Grp Cap (vph)	20	2882			2701			113	128		127	
v/s Ratio Prot	0.00	c0.12			c0.38							
v/s Ratio Perm								c0.05	0.00		0.00	
v/c Ratio	0.05	0.15			0.49			0.57	0.00		0.02	
Uniform Delay, d1	44.0	1.7			4.0			39.8	38.0		38.1	
Progression Factor	1.00	1.00			1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.4	0.1			0.7			3.8	0.0		0.0	
Delay (s)	44.4	1.8			4.7			43.7	38.0		38.1	
Level of Service	D	A			A			D	D		D	
Approach Delay (s)		1.9			4.7			43.5			38.1	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	5.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	51	40	279	44	82	671
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	62	49	340	54	100	818
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1385	367			394	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1385	367			394	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	57	93			91	
cM capacity (veh/h)	144	678			1165	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	111	394	918
Volume Left	62	0	100
Volume Right	49	54	0
cSH	221	1700	1165
Volume to Capacity	0.50	0.23	0.09
Queue Length 95th (ft)	64	0	7
Control Delay (s)	36.7	0.0	2.1
Lane LOS	E		A
Approach Delay (s)	36.7	0.0	2.1
Approach LOS	E		

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	146	310	52	87	945	69	56	110	28	92	265	377
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	0.98		1.00	0.99			0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	1.00
Satd. Flow (prot)	1770	3462		1770	3503			1801			1839	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.99			0.99	1.00
Satd. Flow (perm)	1770	3462		1770	3503			1801			1839	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	159	337	57	95	1027	75	61	120	30	100	288	410
RTOR Reduction (vph)	0	12	0	0	5	0	0	7	0	0	0	281
Lane Group Flow (vph)	159	382	0	95	1097	0	0	204	0	0	388	129
Turn Type	Prot			Prot			Split			Split		custom
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												6
Actuated Green, G (s)	6.1	25.5		7.8	27.2			15.0			22.1	27.2
Effective Green, g (s)	6.1	25.5		7.8	27.2			15.0			22.1	27.2
Actuated g/C Ratio	0.07	0.30		0.09	0.31			0.17			0.26	0.31
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	125	1022		160	1103			313			470	498
v/s Ratio Prot	c0.09	0.11		0.05	c0.31			c0.11			c0.21	
v/s Ratio Perm												0.08
v/c Ratio	1.27	0.37		0.59	0.99			0.65			0.83	0.26
Uniform Delay, d1	40.2	24.1		37.8	29.5			33.3			30.3	22.1
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	170.7	0.2		5.8	25.7			4.8			11.3	0.3
Delay (s)	210.8	24.4		43.6	55.2			38.1			41.6	22.4
Level of Service	F	C		D	E			D			D	C
Approach Delay (s)		78.0			54.3			38.1			31.7	
Approach LOS		E			D			D			C	

Intersection Summary			
HCM Average Control Delay	51.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	86.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	870	0	611	0	0	0	0	371	26	0	209	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5		3.5					5.0			5.0	4.0
Lane Util. Factor	0.97		1.00					0.91			0.95	1.00
Frt	1.00		0.85					0.99			1.00	0.85
Flt Protected	0.95		1.00					1.00			1.00	1.00
Satd. Flow (prot)	3433		1583					5035			3539	1583
Flt Permitted	0.95		1.00					1.00			1.00	1.00
Satd. Flow (perm)	3433		1583					5035			3539	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	897	0	630	0	0	0	0	382	27	0	215	112
RTOR Reduction (vph)	0	0	203	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	897	0	427	0	0	0	0	409	0	0	215	112
Turn Type	Prot		custom									Free
Protected Phases	4		4					2			6	
Permitted Phases												Free
Actuated Green, G (s)	23.7		23.7					10.7			10.7	42.9
Effective Green, g (s)	23.7		23.7					10.7			10.7	42.9
Actuated g/C Ratio	0.55		0.55					0.25			0.25	1.00
Clearance Time (s)	3.5		3.5					5.0			5.0	
Vehicle Extension (s)	4.0		4.0					4.0			4.0	
Lane Grp Cap (vph)	1897		875					1256			883	1583
v/s Ratio Prot	0.26		c0.27					c0.08			0.06	
v/s Ratio Perm												0.07
v/c Ratio	0.47		0.49					0.33			0.24	0.07
Uniform Delay, d1	5.8		5.9					13.2			12.9	0.0
Progression Factor	1.00		1.00					1.00			1.00	1.00
Incremental Delay, d2	0.3		0.6					0.2			0.2	0.1
Delay (s)	6.1		6.5					13.4			13.1	0.1
Level of Service	A		A					B			B	A
Approach Delay (s)		6.2			0.0			13.4			8.6	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM Average Control Delay	7.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	42.9	Sum of lost time (s)	8.5
Intersection Capacity Utilization	51.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	22	2	67	22	233	2	133	71	547	213	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	6.0		5.5	6.0	6.0	5.5	7.0		5.5	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	0.97	0.95		0.97	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3498		1770	3539	1583	3433	3354		3433	3422	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3498		1770	3539	1583	3433	3354		3433	3422	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	33	24	2	74	24	256	2	146	78	601	234	66
RTOR Reduction (vph)	0	2	0	0	0	224	0	59	0	0	15	0
Lane Group Flow (vph)	33	24	0	74	24	32	2	165	0	601	285	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	2.6	5.8		5.2	8.4	8.4	1.1	14.7		18.4	32.0	
Effective Green, g (s)	2.6	5.8		5.2	8.4	8.4	1.1	14.7		18.4	32.0	
Actuated g/C Ratio	0.04	0.09		0.08	0.12	0.12	0.02	0.22		0.27	0.47	
Clearance Time (s)	5.5	6.0		5.5	6.0	6.0	5.5	7.0		5.5	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	4.5		3.0	4.5	
Lane Grp Cap (vph)	68	298		135	437	195	55	724		928	1608	
v/s Ratio Prot	0.02	0.01		c0.04	0.01		0.00	c0.05		c0.18	0.08	
v/s Ratio Perm						c0.02						
v/c Ratio	0.49	0.08		0.55	0.05	0.16	0.04	0.23		0.65	0.18	
Uniform Delay, d1	32.1	28.7		30.3	26.3	26.7	33.0	22.0		22.0	10.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.4	0.1		4.5	0.1	0.4	0.3	0.3		1.6	0.1	
Delay (s)	37.5	28.8		34.8	26.4	27.1	33.2	22.3		23.5	10.5	
Level of Service	D	C		C	C	C	C	C		C	B	
Approach Delay (s)		33.6			28.7			22.4			19.2	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	22.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	68.1	Sum of lost time (s)	24.0
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	609	24	24	295	0	16	0	22	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	5.0	6.0		5.0		5.0			
Lane Util. Factor		0.95	1.00	1.00	0.95		1.00		1.00			
Frt		1.00	0.85	1.00	1.00		1.00		0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (prot)		3539	1583	1770	3539		1770		1583			
Flt Permitted		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (perm)		3539	1583	1770	3539		1770		1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	662	26	26	321	0	17	0	24	0	0	0
RTOR Reduction (vph)	0	0	11	0	0	0	0	0	23	0	0	0
Lane Group Flow (vph)	0	662	15	26	321	0	17	0	1	0	0	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2						4			
Actuated Green, G (s)		23.8	23.8	1.0	29.8		1.0		1.0			
Effective Green, g (s)		23.8	23.8	1.0	29.8		1.0		1.0			
Actuated g/C Ratio		0.57	0.57	0.02	0.71		0.02		0.02			
Clearance Time (s)		6.0	6.0	5.0	6.0		5.0		5.0			
Vehicle Extension (s)		2.0	2.0	3.0	2.0		3.0		3.0			
Lane Grp Cap (vph)		2015	901	42	2523		42		38			
v/s Ratio Prot		c0.19		c0.01	0.09		c0.01					
v/s Ratio Perm			0.01						0.00			
v/c Ratio		0.33	0.02	0.62	0.13		0.40		0.02			
Uniform Delay, d1		4.8	3.9	20.2	1.9		20.1		19.9			
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00			
Incremental Delay, d2		0.0	0.0	24.2	0.0		6.3		0.2			
Delay (s)		4.8	3.9	44.4	1.9		26.4		20.1			
Level of Service		A	A	D	A		C		C			
Approach Delay (s)		4.8			5.1			22.7			0.0	
Approach LOS		A			A			C			A	

Intersection Summary			
HCM Average Control Delay	5.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	41.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	525	107	32	282	42	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		5.0	6.0	5.0	5.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3449		1770	3539	1770	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3449		1770	3539	1770	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	577	118	35	310	46	22
RTOR Reduction (vph)	18	0	0	0	0	20
Lane Group Flow (vph)	677	0	35	310	46	2
Turn Type			Prot			Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	25.6		2.4	33.0	3.9	3.9
Effective Green, g (s)	25.6		2.4	33.0	3.9	3.9
Actuated g/C Ratio	0.53		0.05	0.69	0.08	0.08
Clearance Time (s)	6.0		5.0	6.0	5.0	5.0
Vehicle Extension (s)	4.0		3.0	4.0	3.0	3.0
Lane Grp Cap (vph)	1843		89	2438	144	129
v/s Ratio Prot	c0.20		c0.02	0.09	c0.03	
v/s Ratio Perm						0.00
v/c Ratio	0.37		0.39	0.13	0.32	0.01
Uniform Delay, d1	6.5		22.0	2.5	20.7	20.2
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2		2.9	0.0	1.3	0.0
Delay (s)	6.6		24.9	2.6	22.0	20.3
Level of Service	A		C	A	C	C
Approach Delay (s)	6.6			4.8	21.5	
Approach LOS	A			A	C	

Intersection Summary			
HCM Average Control Delay	7.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	47.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	443	96	93	268	44	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	0.97		1.00	1.00	0.92	
Flt Protected	1.00		0.95	1.00	0.98	
Satd. Flow (prot)	3445		1770	3539	1676	
Flt Permitted	1.00		0.95	1.00	0.98	
Satd. Flow (perm)	3445		1770	3539	1676	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	482	104	101	291	48	76
RTOR Reduction (vph)	23	0	0	0	49	0
Lane Group Flow (vph)	563	0	101	291	75	0
Turn Type			Prot			
Protected Phases	2		1		7	
Permitted Phases				6		
Actuated Green, G (s)	17.6		6.5	29.1	21.7	
Effective Green, g (s)	17.6		6.5	29.1	21.7	
Actuated g/C Ratio	0.29		0.11	0.48	0.36	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Vehicle Extension (s)	2.0		3.0	2.0	3.0	
Lane Grp Cap (vph)	997		189	1694	598	
v/s Ratio Prot	c0.16		c0.06		c0.04	
v/s Ratio Perm				0.08		
v/c Ratio	0.56		0.53	0.17	0.13	
Uniform Delay, d1	18.3		25.7	9.0	13.2	
Progression Factor	1.00		0.75	0.43	1.00	
Incremental Delay, d2	0.4		2.9	0.0	0.1	
Delay (s)	18.8		22.1	3.9	13.3	
Level of Service	B		C	A	B	
Approach Delay (s)	18.8			8.6	13.3	
Approach LOS	B			A	B	

Intersection Summary			
HCM Average Control Delay	14.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	60.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	40.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	513	284	0	450	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0	5.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frpb, ped/bikes		1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	3539		1770	1583
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	3539		1770	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	0	546	302	0	479	82
RTOR Reduction (vph)	0	0	0	0	0	53
Lane Group Flow (vph)	0	546	302	0	479	29
Confl. Peds. (#/hr)					20	
Turn Type						Perm
Protected Phases		2	6		3	
Permitted Phases						3
Actuated Green, G (s)		17.6	29.1		21.7	21.7
Effective Green, g (s)		17.6	29.1		21.7	21.7
Actuated g/C Ratio		0.29	0.48		0.36	0.36
Clearance Time (s)		5.0	5.0		5.0	5.0
Vehicle Extension (s)		2.0	2.0		3.0	3.0
Lane Grp Cap (vph)		1024	1694		632	565
v/s Ratio Prot		c0.15	c0.09		c0.27	
v/s Ratio Perm						0.02
v/c Ratio		0.53	0.18		0.76	0.05
Uniform Delay, d1		18.1	9.0		17.2	12.8
Progression Factor		0.33	1.00		1.00	1.00
Incremental Delay, d2		0.3	0.0		5.2	0.0
Delay (s)		6.2	9.1		22.4	12.8
Level of Service		A	A		C	B
Approach Delay (s)		6.2	9.1		21.0	
Approach LOS		A	A		C	

Intersection Summary			
HCM Average Control Delay	12.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	60.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	36	912	285	97	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0			
Lane Util. Factor	1.00	0.95	0.95			
Frpb, ped/bikes	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00	1.00			
Frt	1.00	1.00	0.96			
Flt Protected	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3539	3390			
Flt Permitted	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3539	3390			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	38	970	303	103	0	0
RTOR Reduction (vph)	0	0	24	0	0	0
Lane Group Flow (vph)	38	970	382	0	0	0
Confl. Peds. (#/hr)				5		
Confl. Bikes (#/hr)				2		
Turn Type	Prot					
Protected Phases	1	6	2			
Permitted Phases						
Actuated Green, G (s)	1.0	34.7	28.7			
Effective Green, g (s)	1.0	34.7	28.7			
Actuated g/C Ratio	0.02	0.74	0.61			
Clearance Time (s)	5.0	5.0	5.0			
Vehicle Extension (s)	3.0	2.0	2.0			
Lane Grp Cap (vph)	38	2618	2074			
v/s Ratio Prot	0.02	c0.27	0.11			
v/s Ratio Perm						
v/c Ratio	1.00	0.37	0.18			
Uniform Delay, d1	22.9	2.2	4.0			
Progression Factor	1.00	1.00	1.00			
Incremental Delay, d2	146.0	0.0	0.0			
Delay (s)	168.9	2.2	4.0			
Level of Service	F	A	A			
Approach Delay (s)		8.5	4.0		0.0	
Approach LOS		A	A		A	

Intersection Summary			
HCM Average Control Delay	7.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	46.9	Sum of lost time (s)	12.2
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	825	57	144	363	22	104
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	868	60	152	382	23	109
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	444			676		
pX, platoon unblocked			0.95		0.95	0.95
vC, conflicting volume			928		1393	464
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			822		1310	334
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			80		80	83
cM capacity (veh/h)			764		115	630

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	579	349	152	191	191	133
Volume Left	0	0	152	0	0	23
Volume Right	0	60	0	0	0	109
cSH	1700	1700	764	1700	1700	353
Volume to Capacity	0.34	0.21	0.20	0.11	0.11	0.38
Queue Length 95th (ft)	0	0	18	0	0	42
Control Delay (s)	0.0	0.0	10.9	0.0	0.0	21.2
Lane LOS			B			C
Approach Delay (s)	0.0		3.1			21.2
Approach LOS						C

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	480	279	248	282	0	325	0	465	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		4.0	5.0		4.0		4.0			
Lane Util. Factor		0.95		1.00	0.95		1.00		1.00			
Frt		0.94		1.00	1.00		1.00		0.85			
Flt Protected		1.00		0.95	1.00		0.95		1.00			
Satd. Flow (prot)		3344		1770	3539		1770		1583			
Flt Permitted		1.00		0.95	1.00		0.95		1.00			
Satd. Flow (perm)		3344		1770	3539		1770		1583			
Peak-hour factor, PHF	0.92	0.96	0.96	0.96	0.96	0.92	0.96	0.92	0.96	0.92	0.92	0.92
Adj. Flow (vph)	0	500	291	258	294	0	339	0	484	0	0	0
RTOR Reduction (vph)	0	88	0	0	0	0	0	0	348	0	0	0
Lane Group Flow (vph)	0	703	0	258	294	0	339	0	136	0	0	0
Turn Type	Perm			Prot			Prot		custom			
Protected Phases		2		1	6		3					
Permitted Phases	2								3			
Actuated Green, G (s)		22.0		16.1	42.1		20.0		20.0			
Effective Green, g (s)		22.0		16.1	42.1		20.0		20.0			
Actuated g/C Ratio		0.31		0.23	0.59		0.28		0.28			
Clearance Time (s)		5.0		4.0	5.0		4.0		4.0			
Vehicle Extension (s)		3.0		3.0	3.0		3.0		3.0			
Lane Grp Cap (vph)		1035		401	2096		498		445			
v/s Ratio Prot		c0.21		c0.15	0.08		c0.19					
v/s Ratio Perm									0.09			
v/c Ratio		0.68		0.64	0.14		0.68		0.31			
Uniform Delay, d1		21.5		24.9	6.4		22.7		20.1			
Progression Factor		1.00		1.00	1.00		1.00		1.00			
Incremental Delay, d2		1.8		3.5	0.0		3.8		0.4			
Delay (s)		23.3		28.4	6.5		26.5		20.5			
Level of Service		C		C	A		C		C			
Approach Delay (s)		23.3			16.7			23.0			0.0	
Approach LOS		C			B			C			A	

Intersection Summary			
HCM Average Control Delay	21.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	71.1	Sum of lost time (s)	13.0
Intersection Capacity Utilization	64.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	156	165	77	254	1013	723	135	469	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0		4.0	4.2		4.0	4.2	
Lane Util. Factor					0.95		0.97	0.91		1.00	0.95	
Frt					0.97		1.00	0.94		1.00	0.96	
Flt Protected					0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					3371		3433	4768		1770	3404	
Flt Permitted					0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)					3371		3433	4768		1770	3404	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	162	172	80	265	1055	753	141	489	167
RTOR Reduction (vph)	0	0	0	0	0	0	0	81	0	0	13	0
Lane Group Flow (vph)	0	0	0	0	414	0	265	1727	0	141	643	0
Turn Type				Split			Prot			Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)					21.5		15.5	79.6		16.7	80.8	
Effective Green, g (s)					21.5		15.5	79.6		16.7	80.8	
Actuated g/C Ratio					0.17		0.12	0.61		0.13	0.62	
Clearance Time (s)					4.0		4.0	4.2		4.0	4.2	
Vehicle Extension (s)					3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)					558		409	2919		227	2116	
v/s Ratio Prot					c0.12		0.08	c0.36		c0.08	0.19	
v/s Ratio Perm												
v/c Ratio					0.74		0.65	0.59		0.62	0.30	
Uniform Delay, d1					51.6		54.6	15.3		53.7	11.5	
Progression Factor					1.00		0.93	1.07		1.00	1.00	
Incremental Delay, d2					5.3		3.2	0.8		5.2	0.4	
Delay (s)					56.9		53.8	17.1		58.9	11.8	
Level of Service					E		D	B		E	B	
Approach Delay (s)		0.0			56.9			21.8			20.2	
Approach LOS		A			E			C			C	

Intersection Summary			
HCM Average Control Delay	25.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	111	185	542	0	0	844	0	759	98	129	628	235
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0			3.5		3.5	3.5	3.0	3.5	4.0
Lane Util. Factor		0.95	1.00			1.00		0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.99			1.00		1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85			0.86		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00			1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3474	1574			1611		3539	1554	3433	3539	1535
Flt Permitted		0.98	1.00			1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3474	1574			1611		3539	1554	3433	3539	1535
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	116	193	565	0	0	879	0	791	102	134	654	245
RTOR Reduction (vph)	0	0	121	0	0	49	0	0	36	0	0	0
Lane Group Flow (vph)	0	309	444	0	0	830	0	791	66	134	654	245
Confl. Peds. (#/hr)						2			2			11
Confl. Bikes (#/hr)			1			5			5			14
Turn Type	Split		custom			custom			custom	Prot		Free
Protected Phases	4!	4	5			2 6 4!		2 11!		1	6 11	
Permitted Phases			4						2			Free
Actuated Green, G (s)		23.9	49.9			101.8		86.2	61.5	10.4	67.1	130.0
Effective Green, g (s)		23.9	49.9			98.8		86.2	61.5	10.4	67.1	130.0
Actuated g/C Ratio		0.18	0.38			0.76		0.66	0.47	0.08	0.52	1.00
Clearance Time (s)		3.0	3.0						3.5	3.0		
Vehicle Extension (s)		3.0	3.0						5.0	3.0		
Lane Grp Cap (vph)		639	604			1224		2347	735	275	1827	1535
v/s Ratio Prot		0.09	c0.15			c0.52		c0.22		0.04	0.18	
v/s Ratio Perm			0.14						0.04			0.16
v/c Ratio		0.48	0.74			0.68		0.34	0.09	0.49	0.36	0.16
Uniform Delay, d1		47.5	34.4			7.7		9.5	18.8	57.2	18.7	0.0
Progression Factor		1.00	1.00			1.00		0.47	1.17	0.97	0.67	1.00
Incremental Delay, d2		0.6	4.6			1.5		0.1	0.2	1.3	0.1	0.2
Delay (s)		48.1	39.0			9.2		4.6	22.3	56.6	12.7	0.2
Level of Service		D	D			A		A	C	E	B	A
Approach Delay (s)		42.2			9.2			6.6			15.4	
Approach LOS		D			A			A			B	

Intersection Summary			
HCM Average Control Delay	18.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	280	0	75	0	1	3	20	548	0	2	994	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1	5.1		5.1		5.1	5.1		5.1	5.1	
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.91	
Frt	1.00	1.00	0.85		0.90		1.00	1.00		1.00	0.98	
Flt Protected	0.95	0.95	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1681	1583		1674		1770	3539		1770	4981	
Flt Permitted	0.95	0.95	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1681	1583		1674		1770	3539		1770	4981	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	304	0	82	0	1	3	22	596	0	2	1080	171
RTOR Reduction (vph)	0	0	72	0	3	0	0	0	0	0	11	0
Lane Group Flow (vph)	152	152	10	0	1	0	22	596	0	2	1240	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases			4									
Actuated Green, G (s)	16.4	16.4	16.4		1.0		4.1	90.4		1.8	88.1	
Effective Green, g (s)	16.4	16.4	16.4		1.0		4.1	90.4		1.8	88.1	
Actuated g/C Ratio	0.13	0.13	0.13		0.01		0.03	0.70		0.01	0.68	
Clearance Time (s)	5.1	5.1	5.1		5.1		5.1	5.1		5.1	5.1	
Vehicle Extension (s)	1.7	1.7	1.7		1.7		1.7	2.2		1.7	2.2	
Lane Grp Cap (vph)	212	212	200		13		56	2461		25	3376	
v/s Ratio Prot	c0.09	0.09			c0.00		0.01	c0.17		0.00	c0.25	
v/s Ratio Perm			0.01									
v/c Ratio	0.72	0.72	0.05		0.08		0.39	0.24		0.08	0.37	
Uniform Delay, d1	54.6	54.6	50.0		64.0		61.7	7.3		63.3	9.0	
Progression Factor	1.00	1.00	1.00		1.00		0.77	1.59		0.92	0.73	
Incremental Delay, d2	9.2	9.2	0.0		0.9		1.5	0.2		0.4	0.3	
Delay (s)	63.8	63.8	50.0		65.0		48.9	11.7		58.9	6.8	
Level of Service	E	E	D		E		D	B		E	A	
Approach Delay (s)		60.9			65.0			13.1			6.9	
Approach LOS		E			E			B			A	

Intersection Summary			
HCM Average Control Delay	17.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.4
Intersection Capacity Utilization	45.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	107	727	51	26	209	272	115	196	110	750	175	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	0.99		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3497		1770	3539	1558	1770	3328		3433	1863	1562
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3497		1770	3539	1558	1770	3328		3433	1863	1562
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	118	799	56	29	230	299	126	215	121	824	192	178
RTOR Reduction (vph)	0	3	0	0	0	224	0	60	0	0	0	112
Lane Group Flow (vph)	118	852	0	29	230	75	126	276	0	824	192	66
Confl. Peds. (#/hr)			6			1			3			1
Confl. Bikes (#/hr)						3						
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	13.9	41.4		5.0	32.5	32.5	13.9	26.5		35.9	48.5	48.5
Effective Green, g (s)	13.9	41.4		5.0	32.5	32.5	13.9	26.5		35.9	48.5	48.5
Actuated g/C Ratio	0.11	0.32		0.04	0.25	0.25	0.11	0.20		0.28	0.37	0.37
Clearance Time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Vehicle Extension (s)	3.0	2.2		3.0	2.2	2.2	3.0	2.2		3.0	2.2	2.2
Lane Grp Cap (vph)	189	1114		68	885	390	189	678		948	695	583
v/s Ratio Prot	c0.07	c0.24		0.02	0.06		0.07	c0.08		c0.24	0.10	
v/s Ratio Perm						0.05						0.04
v/c Ratio	0.62	0.76		0.43	0.26	0.19	0.67	0.41		0.87	0.28	0.11
Uniform Delay, d1	55.6	39.9		61.1	39.1	38.4	55.8	44.9		44.8	28.5	26.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		0.85	0.68	1.14
Incremental Delay, d2	6.3	5.0		4.3	0.1	0.1	8.6	0.2		10.3	0.9	0.4
Delay (s)	61.8	44.9		65.4	39.2	38.5	64.4	45.1		48.4	20.2	30.8
Level of Service	E	D		E	D	D	E	D		D	C	C
Approach Delay (s)		47.0			40.2			50.4			41.2	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	44.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	21.2
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	1541	37	3	489	3	17	0	5	1	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.99	
Satd. Flow (prot)	1770	3527		1770	3536			1770	1583		1653	
Flt Permitted	0.95	1.00		0.95	1.00			1.00	1.00		0.91	
Satd. Flow (perm)	1770	3527		1770	3536			1863	1583		1521	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	1675	40	3	532	3	18	0	5	1	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	5	0	3	0
Lane Group Flow (vph)	7	1715	0	3	535	0	0	18	0	0	1	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		
Actuated Green, G (s)	1.1	93.2		1.0	93.1			2.8	2.8		2.8	
Effective Green, g (s)	1.1	93.2		1.0	93.1			2.8	2.8		2.8	
Actuated g/C Ratio	0.01	0.85		0.01	0.85			0.03	0.03		0.03	
Clearance Time (s)	4.0	5.0		4.0	5.0			4.0	4.0		4.0	
Vehicle Extension (s)	1.5	2.5		1.5	2.5			1.5	1.5		1.5	
Lane Grp Cap (vph)	18	2988		16	2993			47	40		39	
v/s Ratio Prot	c0.00	c0.49		0.00	0.15							
v/s Ratio Perm								c0.01	0.00		0.00	
v/c Ratio	0.39	0.57		0.19	0.18			0.38	0.00		0.03	
Uniform Delay, d1	54.1	2.5		54.1	1.5			52.7	52.2		52.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	5.0	0.8		2.1	0.1			1.9	0.0		0.1	
Delay (s)	59.1	3.3		56.2	1.7			54.6	52.3		52.4	
Level of Service	E	A		E	A			D	D		D	
Approach Delay (s)		3.5			2.0			54.1			52.4	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	3.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	11	41	352	54	29	187
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	13	47	405	62	33	215
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	717	436			467	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	717	436			467	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	92			97	
cM capacity (veh/h)	384	621			1095	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	60	467	248
Volume Left	13	0	33
Volume Right	47	62	0
cSH	549	1700	1095
Volume to Capacity	0.11	0.27	0.03
Queue Length 95th (ft)	9	0	2
Control Delay (s)	12.4	0.0	1.4
Lane LOS	B		A
Approach Delay (s)	12.4	0.0	1.4
Approach LOS	B		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	156	871	81	30	337	79	57	198	57	38	123	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	0.99		1.00	0.97			0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	1.00
Satd. Flow (prot)	1770	3494		1770	3438			1800			1841	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.99			0.99	1.00
Satd. Flow (perm)	1770	3494		1770	3438			1800			1841	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	171	957	89	33	370	87	63	218	63	42	135	56
RTOR Reduction (vph)	0	6	0	0	18	0	0	8	0	0	0	42
Lane Group Flow (vph)	171	1040	0	33	439	0	0	336	0	0	177	14
Turn Type	Prot			Prot			Split			Split		custom
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												6
Actuated Green, G (s)	13.7	33.1		2.0	21.4			21.2			14.2	21.4
Effective Green, g (s)	13.7	33.1		2.0	21.4			21.2			14.2	21.4
Actuated g/C Ratio	0.16	0.38		0.02	0.25			0.25			0.16	0.25
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	280	1337		41	851			441			302	392
v/s Ratio Prot	c0.10	c0.30		0.02	0.13			c0.19			c0.10	
v/s Ratio Perm												0.01
v/c Ratio	0.61	0.78		0.80	0.52			0.76			0.59	0.04
Uniform Delay, d1	33.9	23.5		42.1	28.1			30.3			33.4	24.7
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	3.9	2.9		69.0	0.5			7.6			2.9	0.0
Delay (s)	37.8	26.4		111.0	28.6			38.0			36.3	24.8
Level of Service	D	C		F	C			D			D	C
Approach Delay (s)		28.0			34.2			38.0			33.5	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM Average Control Delay	31.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	86.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
*******************************************************************************
Intersection #1 Willow Pass Rd./SR 4 EB Ramps
*******************************************************************************
Cycle (sec):          180                Critical Vol./Cap.(X):         0.392
Loss Time (sec):        0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         37                Level Of Service:                  A
*******************************************************************************
Street Name:          Willow Pass Rd.                     SR 4 EB Ramps
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected         Protected        Split Phase       Split Phase
Rights:           Include           Ignore            Include           Include
Min. Green:     0     0     0     0     0     0     0     0     0     0     0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        0  0  2  1  0    0  0  2  0  1    2  0  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1189    75     0  294   221   312     0   150     0     0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1189    75     0  294   221   312     0   150     0     0     0
Added Vol:      0    0     0     0    0     0     0     0     0     0     0     0
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:    0 1189    75     0  294   221   312     0   150     0     0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.88 0.88  0.88  0.88 0.88  0.88  0.88 0.88  0.88  0.88 0.88  0.88
PHF Volume:     0 1351    85     0  334   251   355     0   170     0     0     0
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
Reduced Vol:    0 1351    85     0  334   251   355     0   170     0     0     0
RTOR Reduct:    0    0     0     0    0     0     0     0     0     0     0     0
RTOR Vol:       0 1351    85     0  334   251   355     0   170     0     0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0 1351    85     0  334   251   355     0   170     0     0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  0.91 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 2.82  0.18  0.00 2.00  1.00  2.00 0.00  1.00  0.00 0.00  0.00
Final Sat.:     0 4854   306     0 3440  1720  3127     0  1720     0     0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.28  0.28  0.00 0.10  0.15  0.11 0.00  0.10  0.00 0.00  0.00
Crit Volume:       479           0                177                     0
Crit Moves:       ****        ****               ****
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Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #2 San Marco Blvd./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.375
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	36	Level Of Service:	A

Street Name:	San Marco Blvd.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	2 0	1	1 0	2 0	1	1 0	1 0	1	1 0	1 0	2	0 1
Volume Module:												
Base Vol:	10	393	139	204	223	17	84	24	16	189	21	793
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	393	139	204	223	17	84	24	16	189	21	793
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Adjust:	0	0	0	0	0	0	0	0	0	0	0	-648
Initial Fut:	10	393	139	204	223	17	84	24	16	189	21	145
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	11	414	146	215	235	18	88	25	17	199	22	153
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	11	414	146	215	235	18	88	25	17	199	22	153
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	118
RTOR Vol:	11	414	146	215	235	18	88	25	17	199	22	35
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	11	414	146	215	235	18	88	25	17	199	22	35
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	1.48	0.52	2.00	1.86	0.14	1.00	1.20	0.80	1.00	2.00	1.00
Final Sat.:	3000	2438	862	3000	3066	234	1650	1980	1320	1650	3300	1650
Capacity Analysis Module:												
Vol/Sat:	0.00	0.17	0.17	0.07	0.08	0.08	0.05	0.01	0.01	0.12	0.01	0.02
Crit Volume:		280		107				21		199		
Crit Moves:		****		****				****		****		

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #3 Alves Ranch Rd./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.389
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	37	Level Of Service:	A

Street Name:	Alves Ranch Rd.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1 0	1	1 0	0 1	0	1 0	2 0	1	1 0	1 1	0
Volume Module:												
Base Vol:	64	0	20	0	0	0	1	342	16	10	915	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	64	0	20	0	0	0	1	342	16	10	915	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	64	0	20	0	0	0	1	342	16	10	915	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
PHF Volume:	82	0	26	0	0	0	1	438	21	13	1173	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	82	0	26	0	0	0	1	438	21	13	1173	0
RTOR Reduct:	0	0	13	0	0	0	0	0	21	0	0	0
RTOR Vol:	82	0	13	0	0	0	1	438	0	13	1173	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	82	0	13	0	0	0	1	438	0	13	1173	0
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	2.00	1.00	1.00	2.00	0.00
Final Sat.:	1720	1720	1720	1720	1720	0	1720	3440	1720	1720	3440	0
Capacity Analysis Module:												
Vol/Sat:	0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.13	0.00	0.01	0.34	0.00
Crit Volume:	82				0		1				587	
Crit Moves:	****						****				****	

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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #4 Woodhill Dr./W Leland Rd.
********************************************************************************
Cycle (sec):        100                Critical Vol./Cap.(X):        0.394
Loss Time (sec):      0                Average Delay (sec/veh):     xxxxxx
Optimal Cycle:       38                Level Of Service:                 A
********************************************************************************
Street Name:             Woodhill Dr.                       W Leland Rd.
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase        Protected         Protected
Rights:           Include          Include          Include           Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Y+R:          4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0
Lanes:        1  0  0  0  1    0  0  0  0  0    0  0  1  1  0    1  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     164     0    42    0     0     0    0   307    57   20   756     0
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:  164     0    42    0     0     0    0   307    57   20   756     0
Added Vol:      0     0     0    0     0     0    0     0     0    0     0     0
PasserByVol:    0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:  164     0    42    0     0     0    0   307    57   20   756     0
User Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     0.80  0.80  0.80 0.80  0.80  0.80 0.80  0.80  0.80 0.80  0.80  0.80
PHF Volume:   205     0    53    0     0     0    0   384    71   25   945     0
Reduct Vol:     0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:  205     0    53    0     0     0    0   384    71   25   945     0
RTOR Reduct:    0     0    25    0     0     0    0     0     0    0     0     0
RTOR Vol:     205     0    28    0     0     0    0   384    71   25   945     0
PCE Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:  205     0    28    0     0     0    0   384    71   25   945     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720  1720
Adjustment:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Lanes:       1.00  0.00  1.00 0.00  0.00  0.00 0.00  1.69  0.31 1.00  2.00  0.00
Final Sat.:  1720     0  1720    0     0     0    0  2901   539 1720  3440     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.12  0.00  0.02 0.00  0.00  0.00 0.00  0.13  0.13 0.01  0.27  0.00
Crit Volume:  205                    0          0                      472
Crit Moves:  ****                              ****                   ****
********************************************************************************
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Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #5 Southwood Dr./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.415
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	32	Level Of Service:	A

Street Name:	Southwood Dr.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Permitted			Permitted			Protected			Protected	
Rights:		Include			Include			Include			Include	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:		0 0 1! 0 0			0 0 0 0 0			0 0 1 1 0			1 0 2 0 0	
Volume Module:												
Base Vol:	154	0	115	0	0	0	0	307	44	37	619	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	154	0	115	0	0	0	0	307	44	37	619	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	154	0	115	0	0	0	0	307	44	37	619	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
PHF Volume:	190	0	142	0	0	0	0	379	54	46	764	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	190	0	142	0	0	0	0	379	54	46	764	0
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Vol:	190	0	142	0	0	0	0	379	54	46	764	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	190	0	142	0	0	0	0	379	54	46	764	0
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.57	0.00	0.43	0.00	0.00	0.00	0.00	1.75	0.25	1.00	2.00	0.00
Final Sat.:	985	0	735	0	0	0	0	3009	431	1720	3440	0
Capacity Analysis Module:												
Vol/Sat:	0.19	0.00	0.19	0.00	0.00	0.00	0.00	0.13	0.13	0.03	0.22	0.00
Crit Volume:			332	0			0				382	
Crit Moves:			****				****				****	

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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #6 West Bart Driveway/W Leland Rd.
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.253
Loss Time (sec):        0               Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         25               Level Of Service:                  A
********************************************************************************
Street Name:         West Bart Driveway                  W Leland Rd.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  0  0  0   1  0  0  0  1   0  0  2  0  0   0  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0     0    46    0    34    0  422     0    0  622     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0    0     0    46    0    34    0  422     0    0  622     0
Added Vol:      0    0     0     0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0     0    0     0    0    0     0    0    0     0
Initial Fut:    0    0     0    46    0    34    0  422     0    0  622     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.82 0.82  0.82  0.82 0.82  0.82 0.82 0.82  0.82 0.82 0.82  0.82
PHF Volume:     0    0     0    56    0    41    0  515     0    0  759     0
Reduct Vol:     0    0     0     0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0     0    56    0    41    0  515     0    0  759     0
RTOR Reduct:    0    0     0     0    0     0    0    0     0    0    0     0
RTOR Vol:       0    0     0    56    0    41    0  515     0    0  759     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    0    0     0    56    0    41    0  515     0    0  759     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720  1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 0.00  0.00  1.00 0.00  1.00 0.00 2.00  0.00 0.00 2.00  0.00
Final Sat.:     0    0     0  1720    0  1720    0 3440     0    0 3440     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00  0.03 0.00  0.02 0.00 0.15  0.00 0.00 0.22  0.00
Crit Volume:         0          56                0                    379
Crit Moves:                   ****             ****                   ****
********************************************************************************
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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #7 East Bart Driveway/W Leland Rd.
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.302
Loss Time (sec):        0               Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         33               Level Of Service:                  A
********************************************************************************
Street Name:        East Bart Driveway                  W Leland Rd.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Y+R:         4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:       0  0  0  0  0    0  0  0  0  0    1  0  2  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0    0     0    0    0     0   58  407     0    0  621   186
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0    0     0    0    0     0   58  407     0    0  621   186
Added Vol:     0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:   0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:   0    0     0    0    0     0   58  407     0    0  621   186
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.85 0.85  0.85 0.85 0.85  0.85 0.85 0.85  0.85 0.85 0.85  0.85
PHF Volume:    0    0     0    0    0     0   68  479     0    0  731   219
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0    0     0    0    0     0   68  479     0    0  731   219
RTOR Reduct:   0    0     0    0    0     0    0    0     0    0    0     0
RTOR Vol:      0    0     0    0    0     0   68  479     0    0  731   219
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   0    0     0    0    0     0   68  479     0    0  731   219
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800 1800 1800  1800 1800 1800  1800 1800 1800  1800
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 0.00  0.00 0.00 0.00  0.00 1.00 2.00  0.00 0.00 1.54  0.46
Final Sat.:    0    0     0    0    0     0 1800 3600     0    0 2770   830
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.00 0.00  0.00 0.04 0.13  0.00 0.00 0.26  0.26
Crit Volume:        0                0          68                        475
Crit Moves:                                   ****                       ****
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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #9 Bailey Rd./Willow Pass Rd.
********************************************************************************
Cycle (sec):         100                 Critical Vol./Cap.(X):        0.464
Loss Time (sec):       0                 Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        43                 Level Of Service:                 A
********************************************************************************
Street Name:              Bailey Rd.                     Willow Pass Rd.
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase       Split Phase        Protected         Protected
Rights:           Include           Include           Include           Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        1  0  1  0  1    1  0  0  1  0    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     301    0   197    0    0     0    0  230   197  244  827     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  301    0   197    0    0     0    0  230   197  244  827     0
Added Vol:      0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  301    0   197    0    0     0    0  230   197  244  827     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:   317    0   207    0    0     0    0  242   207  257  871     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  317    0   207    0    0     0    0  242   207  257  871     0
RTOR Reduct:    0    0   207    0    0     0    0    0     0    0    0     0
RTOR Vol:     317    0     0    0    0     0    0  242   207  257  871     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  317    0     0    0    0     0    0  242   207  257  871     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       1.00 1.00  1.00 1.00 1.00  0.00 1.00 1.08  0.92 1.00 2.00  0.00
Final Sat.:  1720 1720  1720 1720 1720     0 1720 1853  1587 1720 3440     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.18 0.00  0.00 0.00 0.00  0.00 0.00 0.13  0.13 0.15 0.25  0.00
Crit Volume:  317                    0               225        257
Crit Moves:  ****                                   ****       ****
********************************************************************************
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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #10 Bailey Rd./SR 4 WB Ramps-Canal Rd.
********************************************************************************
Cycle (sec):          100                 Critical Vol./Cap.(X):        0.557
Loss Time (sec):        0                 Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         51                 Level Of Service:                 A
********************************************************************************
Street Name:                 Bailey Rd.                SR 4 WB Ramps-Canal Rd.
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase       Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        2  0  2  1  0   1  0  1  1  0   0  0  0  0  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     462  501   211  120  465   199    0    0     0  253  327   124
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  462  501   211  120  465   199    0    0     0  253  327   124
Added Vol:      0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  462  501   211  120  465   199    0    0     0  253  327   124
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.98 0.98  0.98 0.98 0.98  0.98 0.98 0.98  0.98 0.98 0.98  0.98
PHF Volume:   471  511   215  122  474   203    0    0     0  258  334   127
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  471  511   215  122  474   203    0    0     0  258  334   127
RTOR Reduct:    0    0     0    0    0     0    0    0     0    0    0     0
RTOR Vol:     471  511   215  122  474   203    0    0     0  258  334   127
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  471  511   215  122  474   203    0    0     0  258  334   127
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  0.91 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       2.00 2.11  0.89 1.00 1.40  0.60 0.00 0.00  0.00 0.72 0.93  0.35
Final Sat.:  3127 3631  1529 1720 2409  1031    0    0     0 1236 1598   606
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.15 0.14  0.14 0.07 0.20  0.20 0.00 0.00  0.00 0.21 0.21  0.21
Crit Volume:  236                        339         0               359
Crit Moves:  ****                       ****                        ****
********************************************************************************
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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #11 Bailey Rd./SR 4 EB Ramps-Bart
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):        0.385
Loss Time (sec):       0                Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        37                Level Of Service:                 A
********************************************************************************
Street Name:               Bailey Rd.                    SR 4 EB Ramps-Bart
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase       Split Phase
Rights:           Include          Ignore            Ovl              Ignore
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  2  0  1   2  0  2  0  1   0  1  1  0  1   0  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  681   256   177  623   445   65  109   165    0    0   225
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0  681   256   177  623   445   65  109   165    0    0   225
Added Vol:      0    0     0     0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0     0    0     0    0    0     0    0    0     0
Initial Fut:    0  681   256   177  623   445   65  109   165    0    0   225
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:     0  717   269   186  656   468   68  115   174    0    0   237
Reduct Vol:     0    0     0     0    0     0    0    0     0    0    0     0
Reduced Vol:    0  717   269   186  656   468   68  115   174    0    0   237
RTOR Reduct:    0    0     0     0    0     0    0    0     0    0    0     0
RTOR Vol:       0  717   269   186  656   468   68  115   174    0    0   237
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    0  717   269   186  656   468   68  115   174    0    0   237
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:  1.00 1.00  1.00  0.91 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 2.00  1.00  2.00 2.00  1.00 0.75 1.25  1.00 0.00 0.00  1.00
Final Sat.:     0 3300  1650  3000 3300  1650 1233 2067  1650    0    0  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.22  0.16  0.06 0.20  0.28 0.06 0.06  0.11 0.00 0.00  0.14
Crit Volume:       358          93                         174         0
Crit Moves:        ****       ****                        ****       ****
********************************************************************************
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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #12 Bailey Rd./Maylard St.
********************************************************************************
Cycle (sec):          100                 Critical Vol./Cap.(X):        0.317
Loss Time (sec):        0                 Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         33                 Level Of Service:                 A
********************************************************************************
Street Name:                Bailey Rd.                        Maylard St.
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase       Split Phase
Rights:           Include          Include          Include           Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        1  0  1  1  0   1  0  2  1  0   1  1  0  0  1   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       6  825     1    5  703    75   83    0     8    1    0    16
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    6  825     1    5  703    75   83    0     8    1    0    16
Added Vol:      0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    6  825     1    5  703    75   83    0     8    1    0    16
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92
PHF Volume:     7  897     1    5  764    82   90    0     9    1    0    17
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    7  897     1    5  764    82   90    0     9    1    0    17
RTOR Reduct:    0    0     0    0    0     0    0    0     7    0    0     0
RTOR Vol:       7  897     1    5  764    82   90    0     2    1    0    17
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    7  897     1    5  764    82   90    0     2    1    0    17
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00
Lanes:       1.00 1.99  0.01 1.00 2.71  0.29 2.00 0.00  1.00 0.05 0.01  0.94
Final Sat.:  1650 3296     4 1650 4473   477 3000    0  1650   97    0  1553
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.27  0.27 0.00 0.17  0.17 0.03 0.00  0.00 0.01 0.00  0.01
Crit Volume:             449    5                 45                        18
Crit Moves:             ****  ****              ****                      ****
********************************************************************************
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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #13 Bailey Rd./W Leland Rd.
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):        0.681
Loss Time (sec):        0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         72                Level Of Service:                  B
********************************************************************************
Street Name:                Bailey Rd.                       W Leland Rd.
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Y+R:          4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0
Lanes:        1  0  1  1  0   2  0  1  0  1   1  0  1  1  0   1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      73   205    19   187   377   165   142   142   211   185   659   489
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:   73   205    19   187   377   165   142   142   211   185   659   489
Added Vol:      0     0     0     0     0     0     0     0     0     0     0     0
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   73   205    19   187   377   165   142   142   211   185   659   489
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     0.87  0.87  0.87  0.87  0.87  0.87  0.87  0.87  0.87  0.87  0.87  0.87
PHF Volume:    84   236    22   215   433   190   163   163   243   213   757   562
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   84   236    22   215   433   190   163   163   243   213   757   562
RTOR Reduct:    0     0     0     0     0   163     0     0     0     0     0   118
RTOR Vol:      84   236    22   215   433    26   163   163   243   213   757   444
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:   84   236    22   215   433    26   163   163   243   213   757   444
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650  1650  1650  1650  1650  1650  1650  1650  1650  1650  1650  1650
Adjustment:  1.00  1.00  1.00  0.91  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       1.00  1.83  0.17  2.00  1.00  1.00  1.00  1.00  1.00  1.00  2.00  1.00
Final Sat.:  1650  3020   280  3000  1650  1650  1650  1650  1650  1650  3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.05  0.08  0.08  0.07  0.26  0.02  0.10  0.10  0.15  0.13  0.23  0.27
Crit Volume:   84                     433         163                         444
Crit Moves:  ****                    ****        ****                        ****
********************************************************************************
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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #14 Chestnut Dr./W Leland Rd.
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):        0.432
Loss Time (sec):       0                Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        33                Level Of Service:                 A
********************************************************************************
Street Name:             Chestnut Dr.                     W Leland Rd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  1  0  0  1   0  0  1! 0  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      56    0     2    2    0     7    1  357    14    0 1162     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   56    0     2    2    0     7    1  357    14    0 1162     0
Added Vol:      0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:   56    0     2    2    0     7    1  357    14    0 1162     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.87 0.87  0.87 0.87 0.87  0.87 0.87 0.87  0.87 0.87 0.87  0.87
PHF Volume:    64    0     2    2    0     8    1  410    16    0 1336     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   64    0     2    2    0     8    1  410    16    0 1336     0
RTOR Reduct:    0    0     0    0    0     0    0    0     0    0    0     0
RTOR Vol:      64    0     2    2    0     8    1  410    16    0 1336     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   64    0     2    2    0     8    1  410    16    0 1336     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       1.00 0.00  1.00 0.22 0.00  0.78 1.00 1.92  0.08 1.00 2.00  0.00
Final Sat.:  1720    0  1720  382    0  1338 1720 3310   130 1720 3440     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04 0.00  0.00 0.01 0.00  0.01 0.00 0.12  0.12 0.00 0.39  0.00
Crit Volume:   64                         10    1                     668
Crit Moves:  ****                       **** ****                    ****
********************************************************************************
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Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #16 Bailey Rd./Concord Blvd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.793
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	110	Level Of Service:	C

Street Name:	Bailey Rd.		Concord Blvd.	
Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Split Phase	Split Phase	Protected	Protected
Rights:	Include	Include	Include	Include
Lanes:	0 0 1! 0 0	0 1 0 0 1	1 0 1 1 0	1 0 1 1 0

Movement:	NB L	NB T	NB R	SB L	SB T	SB R	EB L	EB T	EB R	WB L	WB T	WB R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	56	110	28	92	265	377	146	310	52	87	945	69
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	56	110	28	92	265	377	146	310	52	87	945	69
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	56	110	28	92	265	377	146	310	52	87	945	69
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	61	120	30	100	288	410	159	337	57	95	1027	75
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	61	120	30	100	288	410	159	337	57	95	1027	75
RTOR Reduct:	0	0	0	0	0	159	0	0	0	0	0	0
RTOR Vol:	61	120	30	100	288	251	159	337	57	95	1027	75
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	61	120	30	100	288	251	159	337	57	95	1027	75
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.29	0.57	0.14	0.26	0.74	1.00	1.00	1.71	0.29	1.00	1.86	0.14
Final Sat.:	476	936	238	425	1225	1650	1650	2826	474	1650	3075	225
Capacity Analysis Module:												
Vol/Sat:	0.13	0.13	0.13	0.24	0.24	0.15	0.10	0.12	0.12	0.06	0.33	0.33
Crit Volume:			211		388		159					551
Crit Moves:			****		****		****					****

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #1 Willow Pass Rd./SR 4 EB Ramps

Cycle (sec):	180	Critical Vol./Cap.(X):	0.446
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	41	Level Of Service:	A

Street Name:	Willow Pass Rd.						SR 4 EB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Ignore			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0 0	2 1	0	0 0	2 0	1	2 0	0 0	1	0 0	0 0	0
Volume Module:												
Base Vol:	0	371	26	0	209	109	870	0	611	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	371	26	0	209	109	870	0	611	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	371	26	0	209	109	870	0	611	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
PHF Volume:	0	382	27	0	215	112	897	0	630	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	382	27	0	215	112	897	0	630	0	0	0
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Vol:	0	382	27	0	215	112	897	0	630	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	382	27	0	215	112	897	0	630	0	0	0
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	2.80	0.20	0.00	2.00	1.00	2.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	0	4822	338	0	3440	1720	3127	0	1720	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.08	0.08	0.00	0.06	0.07	0.29	0.00	0.37	0.00	0.00	0.00
Crit Volume:			136	0					630		0	
Crit Moves:			****	****					****			

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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #2 San Marco Blvd./W Leland Rd.
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):        0.321
Loss Time (sec):       0               Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        34               Level Of Service:                 A
********************************************************************************
Street Name:          San Marco Blvd.                     W Leland Rd.
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        2  0  1  1  0   2  0  1  1  0   1  0  1  1  0   1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       2  133    71  547  213    60   30   22     2   67   22   233
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    2  133    71  547  213    60   30   22     2   67   22   233
Added Vol:      0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    2  133    71  547  213    60   30   22     2   67   22   233
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91 0.91 0.91  0.91 0.91 0.91  0.91 0.91 0.91  0.91
PHF Volume:     2  146    78  601  234    66   33   24     2   74   24   256
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    2  146    78  601  234    66   33   24     2   74   24   256
RTOR Reduct:    0    0     0    0    0     0    0    0     0    0    0   256
RTOR Vol:       2  146    78  601  234    66   33   24     2   74   24     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    2  146    78  601  234    66   33   24     2   74   24     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:  0.91 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       2.00 1.30  0.70 2.00 1.56  0.44 1.00 1.83  0.17 1.00 2.00  1.00
Final Sat.:  3000 2151  1149 3000 2575   725 1650 3025   275 1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.07  0.07 0.20 0.09  0.09 0.02 0.01  0.01 0.04 0.01  0.00
Crit Volume:             112  301                           13   74
Crit Moves:             ****  ****                        **** ****
********************************************************************************
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Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #3 Alves Ranch Rd./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.218
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	29	Level Of Service:	A

Street Name:	Alves Ranch Rd.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1 0	1	1 0	0 1	0	1 0	2 0	1	1 0	1 1	0
Volume Module:												
Base Vol:	16	0	22	0	0	0	0	609	24	24	295	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	16	0	22	0	0	0	0	609	24	24	295	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	16	0	22	0	0	0	0	609	24	24	295	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	17	0	24	0	0	0	0	662	26	26	321	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	17	0	24	0	0	0	0	662	26	26	321	0
RTOR Reduct:	0	0	24	0	0	0	0	0	17	0	0	0
RTOR Vol:	17	0	0	0	0	0	0	662	9	26	321	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	17	0	0	0	0	0	0	662	9	26	321	0
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	2.00	1.00	1.00	2.00	0.00
Final Sat.:	1720	1720	1720	1720	1720	0	1720	3440	1720	1720	3440	0
Capacity Analysis Module:												
Vol/Sat:	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.01	0.02	0.09	0.00
Crit Volume:	17				0			331		26		
Crit Moves:	****							****		****		

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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #4 Woodhill Dr./W Leland Rd.
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):        0.249
Loss Time (sec):        0                Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         30                Level Of Service:                 A
********************************************************************************
Street Name:                Woodhill Dr.                    W Leland Rd.
Approach:        North Bound      South Bound       East Bound        West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Split Phase      Split Phase       Protected         Protected
Rights:            Include          Include          Include           Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:         1  0  0  0  1   0  0  0  0  0   0  0  1  1  0   1  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       42    0    20     0    0     0     0  525   107    32  282     0
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    42    0    20     0    0     0     0  525   107    32  282     0
Added Vol:       0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:     0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    42    0    20     0    0     0     0  525   107    32  282     0
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91
PHF Volume:     46    0    22     0    0     0     0  577   118    35  310     0
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    46    0    22     0    0     0     0  577   118    35  310     0
RTOR Reduct:     0    0    22     0    0     0     0    0     0     0    0     0
RTOR Vol:       46    0     0     0    0     0     0  577   118    35  310     0
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    46    0     0     0    0     0     0  577   118    35  310     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1720 1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:        1.00 0.00  1.00  0.00 0.00  0.00  0.00 1.66  0.34  1.00 2.00  0.00
Final Sat.:   1720    0  1720     0    0     0     0 2858   582  1720 3440     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.03 0.00  0.00  0.00 0.00  0.00  0.00 0.20  0.20  0.02 0.09  0.00
Crit Volume:    46                     0                     347    35
Crit Moves:   ****                                          ****  ****
********************************************************************************
```

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #5 Southwood Dr./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.301
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	27	Level Of Service:	A

Street Name:	Southwood Dr.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0 0	1!	0 0	0 0	0	0 0	0 0	1	1 0	1 0	2	0 0
Volume Module:												
Base Vol:	44	0	70	0	0	0	0	443	96	93	268	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	44	0	70	0	0	0	0	443	96	93	268	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	44	0	70	0	0	0	0	443	96	93	268	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	48	0	76	0	0	0	0	482	104	101	291	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	48	0	76	0	0	0	0	482	104	101	291	0
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Vol:	48	0	76	0	0	0	0	482	104	101	291	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	48	0	76	0	0	0	0	482	104	101	291	0
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.39	0.00	0.61	0.00	0.00	0.00	0.00	1.64	0.36	1.00	2.00	0.00
Final Sat.:	664	0	1056	0	0	0	0	2827	613	1720	3440	0
Capacity Analysis Module:												
Vol/Sat:	0.07	0.00	0.07	0.00	0.00	0.00	0.00	0.17	0.17	0.06	0.08	0.00
Crit Volume:			124	0					293	101		
Crit Moves:			****						****	****		

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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #6 West Bart Driveway/W Leland Rd.
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.437
Loss Time (sec):        0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         33                Level Of Service:                  A
********************************************************************************
Street Name:        West Bart Driveway                  W Leland Rd.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Y+R:         4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0
Lanes:        0  0  0  0  0    1  0  0  0  1    0  0  2  0  0    0  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0     0     0  450     0    77    0   513     0    0   284     0
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:   0     0     0  450     0    77    0   513     0    0   284     0
Added Vol:     0     0     0    0     0     0    0     0     0    0     0     0
PasserByVol:   0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:   0     0     0  450     0    77    0   513     0    0   284     0
User Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94
PHF Volume:    0     0     0  479     0    82    0   546     0    0   302     0
Reduct Vol:    0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:   0     0     0  479     0    82    0   546     0    0   302     0
RTOR Reduct:   0     0     0    0     0     0    0     0     0    0     0     0
RTOR Vol:      0     0     0  479     0    82    0   546     0    0   302     0
PCE Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:   0     0     0  479     0    82    0   546     0    0   302     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720  1720
Adjustment:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Lanes:       0.00  0.00  0.00 1.00  0.00  1.00 0.00  2.00  0.00 0.00  2.00  0.00
Final Sat.:    0     0     0 1720     0  1720    0  3440     0    0  3440     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.00 0.28  0.00  0.05 0.00  0.16  0.00 0.00  0.09  0.00
Crit Volume:         0         479                    273          0
Crit Moves:                   ****                   ****        ****
********************************************************************************
```

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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #7 East Bart Driveway/W Leland Rd.
********************************************************************************
Cycle (sec):          100                 Critical Vol./Cap.(X):         0.270
Loss Time (sec):        0                 Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         31                 Level Of Service:                  A
********************************************************************************
Street Name:        East Bart Driveway                 W Leland Rd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Split Phase      Split Phase       Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Y+R:         4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:       0  0  0  0  0   0  0  0  0  0   1  0  2  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0    0     0    0    0     0   36  912     0    0  285    97
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0    0     0    0    0     0   36  912     0    0  285    97
Added Vol:     0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:   0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:   0    0     0    0    0     0   36  912     0    0  285    97
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94
PHF Volume:    0    0     0    0    0     0   38  970     0    0  303   103
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0    0     0    0    0     0   38  970     0    0  303   103
RTOR Reduct:   0    0     0    0    0     0    0    0     0    0    0     0
RTOR Vol:      0    0     0    0    0     0   38  970     0    0  303   103
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   0    0     0    0    0     0   38  970     0    0  303   103
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800 1800 1800  1800 1800 1800  1800 1800 1800  1800
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 0.00  0.00 0.00 0.00  0.00 1.00 2.00  0.00 0.00 1.49  0.51
Final Sat.:    0    0     0    0    0     0 1800 3600     0    0 2686   914
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.00 0.00  0.00 0.02 0.27  0.00 0.00 0.11  0.11
Crit Volume:        0                0              485          0
Crit Moves:                                        ****        ****
********************************************************************************
```

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #9 Bailey Rd./Willow Pass Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.577
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	54	Level Of Service:	A

Street Name:	Bailey Rd.						Willow Pass Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1	0 1	1 0	0	1 0	1 0	1	1 0	1 0	1	1 0
Volume Module:												
Base Vol:	325	0	465	0	0	0	0	480	279	248	282	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	325	0	465	0	0	0	0	480	279	248	282	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	325	0	465	0	0	0	0	480	279	248	282	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	339	0	484	0	0	0	0	500	291	258	294	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	339	0	484	0	0	0	0	500	291	258	294	0
RTOR Reduct:	0	0	258	0	0	0	0	0	0	0	0	0
RTOR Vol:	339	0	226	0	0	0	0	500	291	258	294	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	339	0	226	0	0	0	0	500	291	258	294	0
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.26	0.74	1.00	2.00	0.00
Final Sat.:	1720	1720	1720	1720	1720	0	1720	2175	1265	1720	3440	0
Capacity Analysis Module:												
Vol/Sat:	0.20	0.00	0.13	0.00	0.00	0.00	0.00	0.23	0.23	0.15	0.09	0.00
Crit Volume:	339				0			395		258		
Crit Moves:	****							****		****		

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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #10 Bailey Rd./SR 4 WB Ramps-Canal Rd.
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):        0.640
Loss Time (sec):        0                Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         63                Level Of Service:                 B
********************************************************************************
Street Name:                Bailey Rd.                SR 4 WB Ramps-Canal Rd.
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        2  0  2  1  0   1  0  1  1  0   0  0  0  0  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     254 1013   723  135  469   160    0    0     0  156  165    77
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  254 1013   723  135  469   160    0    0     0  156  165    77
Added Vol:      0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  254 1013   723  135  469   160    0    0     0  156  165    77
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96 0.96 0.96  0.96 0.96 0.96  0.96 0.96 0.96  0.96
PHF Volume:   265 1055   753  141  489   167    0    0     0  163  172    80
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  265 1055   753  141  489   167    0    0     0  163  172    80
RTOR Reduct:    0    0     0    0    0     0    0    0     0    0    0     0
RTOR Vol:     265 1055   753  141  489   167    0    0     0  163  172    80
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  265 1055   753  141  489   167    0    0     0  163  172    80
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  0.91 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       2.00 2.00  1.00 1.00 1.49  0.51 0.00 0.00  0.00 0.78 0.83  0.39
Final Sat.:  3127 3440  1720 1720 2565   875    0    0     0 1348 1426   666
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.08 0.31  0.44 0.08 0.19  0.19 0.00 0.00  0.00 0.12 0.12  0.12
Crit Volume:               753  141                     0               207
Crit Moves:               **** ****                                    ****
********************************************************************************
```

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--------------------------------------------------------------------------------
                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #11 Bailey Rd./SR 4 EB Ramps-Bart
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):        0.627
Loss Time (sec):       0                Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        61                Level Of Service:                 B
********************************************************************************
Street Name:               Bailey Rd.                     SR 4 EB Ramps-Bart
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Split Phase       Split Phase
Rights:          Include           Ignore             Ovl             Ignore
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  2  0  1    2  0  2  0  1    0  1  1  0  1    0  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  759    98   129  628   235   111  185   542     0    0   844
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  759    98   129  628   235   111  185   542     0    0   844
Added Vol:     0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   0  759    98   129  628   235   111  185   542     0    0   844
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:    0  791   102   134  654   245   116  193   565     0    0   879
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0  791   102   134  654   245   116  193   565     0    0   879
RTOR Reduct:   0    0     0     0    0     0     0    0     0     0    0     0
RTOR Vol:      0  791   102   134  654   245   116  193   565     0    0   879
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   0  791   102   134  654   245   116  193   565     0    0   879
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 2.00  1.00  2.00 2.00  1.00  0.75 1.25  1.00  0.00 0.00  1.00
Final Sat.:     0 3300  1650  3000 3300  1650  1238 2062  1650     0    0  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.24  0.06  0.04 0.20  0.15  0.09 0.09  0.34  0.00 0.00  0.53
Crit Volume:       395          67                           565          0
Crit Moves:        ****        ****                          ****       ****
********************************************************************************
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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #12 Bailey Rd./Maylard St.
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.370
Loss Time (sec):        0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         36                Level Of Service:                  A
********************************************************************************
Street Name:                 Bailey Rd.                        Maylard St.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        1  0  1  1  0   1  0  2  1  0   1  1  0  0  1   0  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      20  548     0    2  994   157  280    0    75    0    1     3
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   20  548     0    2  994   157  280    0    75    0    1     3
Added Vol:      0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:   20  548     0    2  994   157  280    0    75    0    1     3
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92
PHF Volume:    22  596     0    2 1080   171  304    0    82    0    1     3
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   22  596     0    2 1080   171  304    0    82    0    1     3
RTOR Reduct:    0    0     0    0    0     0    0    0    22    0    0     0
RTOR Vol:      22  596     0    2 1080   171  304    0    60    0    1     3
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   22  596     0    2 1080   171  304    0    60    0    1     3
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00
Lanes:       1.00 2.00  0.00 1.00 2.59  0.41 2.00 0.00  1.00 0.00 0.25  0.75
Final Sat.:  1650 3300     0 1650 4275   675 3000    0  1650    0  413  1237
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.18  0.00 0.00 0.25  0.25 0.10 0.00  0.04 0.00 0.00  0.00
Crit Volume:   22                          417  152                          4
Crit Moves:  ****                         **** ****                       ****
********************************************************************************
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Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #13 Bailey Rd./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.653
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	66	Level Of Service:	B

Street Name:	Bailey Rd.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0 1 1 0			2 0 1 0 1			1 0 1 1 0			1 0 2 0 1		
Volume Module:												
Base Vol:	115	196	110	750	175	162	107	727	51	26	209	272
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	115	196	110	750	175	162	107	727	51	26	209	272
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	115	196	110	750	175	162	107	727	51	26	209	272
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	126	215	121	824	192	178	118	799	56	29	230	299
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	126	215	121	824	192	178	118	799	56	29	230	299
RTOR Reduct:	0	0	0	0	0	118	0	0	0	0	0	299
RTOR Vol:	126	215	121	824	192	60	118	799	56	29	230	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	126	215	121	824	192	60	118	799	56	29	230	0
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.28	0.72	2.00	1.00	1.00	1.00	1.87	0.13	1.00	2.00	1.00
Final Sat.:	1650	2114	1186	3000	1650	1650	1650	3084	216	1650	3300	1650
Capacity Analysis Module:												
Vol/Sat:	0.08	0.10	0.10	0.27	0.12	0.04	0.07	0.26	0.26	0.02	0.07	0.00
Crit Volume:		168		412					427	29		
Crit Moves:		****		****					****	****		

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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #14 Chestnut Dr./W Leland Rd.
********************************************************************************
Cycle (sec):         100                 Critical Vol./Cap.(X):        0.514
Loss Time (sec):       0                 Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        38                 Level Of Service:                 A
********************************************************************************
Street Name:              Chestnut Dr.                     W Leland Rd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        0  1  0  0  1    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      17    0     5     1    0     3     6 1541    37     3  489     3
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   17    0     5     1    0     3     6 1541    37     3  489     3
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   17    0     5     1    0     3     6 1541    37     3  489     3
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:    18    0     5     1    0     3     7 1675    40     3  532     3
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   18    0     5     1    0     3     7 1675    40     3  532     3
RTOR Reduct:    0    0     3     0    0     0     0    0     0     0    0     0
RTOR Vol:      18    0     2     1    0     3     7 1675    40     3  532     3
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   18    0     2     1    0     3     7 1675    40     3  532     3
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 0.00  1.00  0.25 0.00  0.75  1.00 1.95  0.05  1.00 1.99  0.01
Final Sat.:  1720    0  1720   430    0  1290  1720 3359    81  1720 3419    21
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.00  0.00  0.00 0.00  0.00  0.00 0.50  0.50  0.00 0.16  0.16
Crit Volume:   18                           4        858           3
Crit Moves:  ****                        ****       ****        ****
********************************************************************************
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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
*********************************************************************************
Intersection #16 Bailey Rd./Concord Blvd.
*********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):          0.652
Loss Time (sec):        0                Average Delay (sec/veh):       xxxxxx
Optimal Cycle:         66                Level Of Service:                   B
*********************************************************************************
Street Name:                Bailey Rd.                     Concord Blvd.
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
-------------|---------------||---------------||---------------||---------------|
Control:        Split Phase       Split Phase        Protected         Protected
Rights:           Include           Include           Include           Include
Min. Green:    0     0     0     0     0     0     0     0     0     0     0     0
Y+R:         4.0   4.0   4.0   4.0   4.0   4.0   4.0   4.0   4.0   4.0   4.0   4.0
Lanes:        0  0  1! 0  0    0  1  0  0  1    1  0  1  1  0    1  0  1  1  0
-------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      57  198    57    38  123    51   156  871    81    30  337    79
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   57  198    57    38  123    51   156  871    81    30  337    79
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   57  198    57    38  123    51   156  871    81    30  337    79
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91
PHF Volume:    63  218    63    42  135    56   171  957    89    33  370    87
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   63  218    63    42  135    56   171  957    89    33  370    87
RTOR Reduct:    0    0     0     0    0    56     0    0     0     0    0     0
RTOR Vol:      63  218    63    42  135     0   171  957    89    33  370    87
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   63  218    63    42  135     0   171  957    89    33  370    87
-------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.18 0.64  0.18  0.24 0.76  1.00  1.00 1.83  0.17  1.00 1.62  0.38
Final Sat.:   301 1047   301   389 1261  1650  1650 3019   281  1650 2673   627
-------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.21 0.21  0.21  0.11 0.11  0.00  0.10 0.32  0.32  0.02 0.14  0.14
Crit Volume:       343               177                     523    33
Crit Moves:       ****              ****                    ****  ****
*********************************************************************************
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APPENDIX D:
EXISTING PLUS PROJECT
LEVEL OF SERVICE
CALCULATION SHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	312	0	224	0	0	0	0	1301	75	0	294	221
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5		3.5					5.0			5.0	4.0
Lane Util. Factor	0.97		1.00					0.91			0.95	1.00
Frt	1.00		0.85					0.99			1.00	0.85
Flt Protected	0.95		1.00					1.00			1.00	1.00
Satd. Flow (prot)	3433		1583					5044			3539	1583
Flt Permitted	0.95		1.00					1.00			1.00	1.00
Satd. Flow (perm)	3433		1583					5044			3539	1583
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	355	0	255	0	0	0	0	1478	85	0	334	251
RTOR Reduction (vph)	0	0	194	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	355	0	61	0	0	0	0	1563	0	0	334	251
Turn Type	Prot		custom									Free
Protected Phases	4		4					2			6	
Permitted Phases												Free
Actuated Green, G (s)	12.1		12.1					30.3			30.3	50.9
Effective Green, g (s)	12.1		12.1					30.3			30.3	50.9
Actuated g/C Ratio	0.24		0.24					0.60			0.60	1.00
Clearance Time (s)	3.5		3.5					5.0			5.0	
Vehicle Extension (s)	4.0		4.0					4.0			4.0	
Lane Grp Cap (vph)	816		376					3003			2107	1583
v/s Ratio Prot	c0.10		0.04					c0.31			0.09	
v/s Ratio Perm												0.16
v/c Ratio	0.44		0.16					0.52			0.16	0.16
Uniform Delay, d1	16.5		15.4					6.0			4.6	0.0
Progression Factor	1.00		1.00					1.00			1.00	1.00
Incremental Delay, d2	0.5		0.3					0.2			0.0	0.2
Delay (s)	17.0		15.7					6.3			4.7	0.2
Level of Service	B		B					A			A	A
Approach Delay (s)		16.4			0.0			6.3			2.7	
Approach LOS		B			A			A			A	

Intersection Summary			
HCM Average Control Delay	7.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	50.9	Sum of lost time (s)	8.5
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	84	24	16	190	21	905	10	393	140	278	223	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	6.0		5.5	6.0	6.0	5.5	7.0		5.5	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	0.97	0.95		0.97	0.95	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3323		1770	3539	1583	3433	3400		3433	3501	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3323		1770	3539	1583	3433	3400		3433	3501	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	102	29	20	232	26	1104	12	479	171	339	272	21
RTOR Reduction (vph)	0	17	0	0	0	766	0	28	0	0	4	0
Lane Group Flow (vph)	102	32	0	232	26	338	12	622	0	339	289	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	11.7	14.8		25.7	28.8	28.8	1.2	32.5		15.4	46.7	
Effective Green, g (s)	11.7	14.8		25.7	28.8	28.8	1.2	32.5		15.4	46.7	
Actuated g/C Ratio	0.10	0.13		0.23	0.26	0.26	0.01	0.29		0.14	0.42	
Clearance Time (s)	5.5	6.0		5.5	6.0	6.0	5.5	7.0		5.5	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	4.5		3.0	4.5	
Lane Grp Cap (vph)	184	438		405	907	406	37	983		470	1455	
v/s Ratio Prot	0.06	0.01		c0.13	0.01		0.00	c0.18		c0.10	0.08	
v/s Ratio Perm						c0.21						
v/c Ratio	0.55	0.07		0.57	0.03	0.83	0.32	0.63		0.72	0.20	
Uniform Delay, d1	47.9	42.8		38.5	31.3	39.5	55.2	34.8		46.4	20.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.6	0.1		2.0	0.0	13.6	5.1	1.7		5.4	0.1	
Delay (s)	51.5	42.9		40.4	31.3	53.1	60.3	36.4		51.8	21.0	
Level of Service	D	D		D	C	D	E	D		D	C	
Approach Delay (s)		48.7			50.5			36.9			37.6	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	44.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	112.4	Sum of lost time (s)	24.0
Intersection Capacity Utilization	92.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	417	16	11	1028	0	64	0	21	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	5.0	6.0		5.0		5.0			
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00		1.00			
Frt	1.00	1.00	0.85	1.00	1.00		1.00		0.85			
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (prot)	1770	3539	1583	1770	3539		1770		1583			
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (perm)	1770	3539	1583	1770	3539		1770		1583			
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	1	535	21	14	1318	0	82	0	27	0	0	0
RTOR Reduction (vph)	0	0	9	0	0	0	0	0	24	0	0	0
Lane Group Flow (vph)	1	535	12	14	1318	0	82	0	3	0	0	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2						4			
Actuated Green, G (s)	1.3	34.4	34.4	1.3	34.4		6.6		6.6			
Effective Green, g (s)	1.3	34.4	34.4	1.3	34.4		6.6		6.6			
Actuated g/C Ratio	0.02	0.59	0.59	0.02	0.59		0.11		0.11			
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0		5.0		5.0			
Vehicle Extension (s)	3.0	2.0	2.0	3.0	2.0		3.0		3.0			
Lane Grp Cap (vph)	39	2088	934	39	2088		200		179			
v/s Ratio Prot	0.00	0.15		c0.01	c0.37		c0.05					
v/s Ratio Perm			0.01						0.00			
v/c Ratio	0.03	0.26	0.01	0.36	0.63		0.41		0.02			
Uniform Delay, d1	27.9	5.8	4.9	28.1	7.8		24.0		23.0			
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00		1.00			
Incremental Delay, d2	0.3	0.0	0.0	5.6	0.5		1.4		0.0			
Delay (s)	28.1	5.8	4.9	33.7	8.3		25.4		23.0			
Level of Service	C	A	A	C	A		C		C			
Approach Delay (s)		5.8			8.5			24.8			0.0	
Approach LOS		A			A			C			A	

Intersection Summary			
HCM Average Control Delay	8.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	58.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	383	57	21	870	164	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		5.0	6.0	5.0	5.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3471		1770	3539	1770	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3471		1770	3539	1770	1583
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	479	71	26	1088	205	54
RTOR Reduction (vph)	13	0	0	0	0	43
Lane Group Flow (vph)	537	0	26	1088	205	11
Turn Type			Prot			Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	26.9		1.3	33.2	10.9	10.9
Effective Green, g (s)	26.9		1.3	33.2	10.9	10.9
Actuated g/C Ratio	0.49		0.02	0.60	0.20	0.20
Clearance Time (s)	6.0		5.0	6.0	5.0	5.0
Vehicle Extension (s)	4.0		3.0	4.0	3.0	3.0
Lane Grp Cap (vph)	1695		42	2132	350	313
v/s Ratio Prot	0.15		0.01	c0.31	c0.12	
v/s Ratio Perm						0.01
v/c Ratio	0.32		0.62	0.51	0.59	0.03
Uniform Delay, d1	8.5		26.7	6.3	20.1	17.8
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1		24.2	0.3	2.5	0.0
Delay (s)	8.7		50.8	6.6	22.5	17.9
Level of Service	A		D	A	C	B
Approach Delay (s)	8.7			7.6	21.6	
Approach LOS	A			A	C	

Intersection Summary			
HCM Average Control Delay	9.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	55.1	Sum of lost time (s)	11.0
Intersection Capacity Utilization	42.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	449	44	38	692	154	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	0.99		1.00	1.00	0.94	
Flt Protected	1.00		0.95	1.00	0.97	
Satd. Flow (prot)	3492		1770	3539	1706	
Flt Permitted	1.00		0.95	1.00	0.97	
Satd. Flow (perm)	3492		1770	3539	1706	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	554	54	47	854	190	143
RTOR Reduction (vph)	9	0	0	0	36	0
Lane Group Flow (vph)	599	0	47	854	297	0
Turn Type			Prot			
Protected Phases	2		1		7	
Permitted Phases				6		
Actuated Green, G (s)	23.6		3.8	26.3	16.0	
Effective Green, g (s)	23.6		3.8	26.3	16.0	
Actuated g/C Ratio	0.40		0.07	0.45	0.27	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Vehicle Extension (s)	2.0		3.0	2.0	3.0	
Lane Grp Cap (vph)	1411		115	1594	467	
v/s Ratio Prot	0.17		c0.03		c0.17	
v/s Ratio Perm				c0.24		
v/c Ratio	0.42		0.41	0.54	0.64	
Uniform Delay, d1	12.5		26.2	11.6	18.6	
Progression Factor	1.00		1.50	0.21	1.00	
Incremental Delay, d2	0.1		2.2	0.2	2.8	
Delay (s)	12.6		41.6	2.6	21.5	
Level of Service	B		D	A	C	
Approach Delay (s)	12.6			4.7	21.5	
Approach LOS	B			A	C	

Intersection Summary			
HCM Average Control Delay	10.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	58.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	30	535	689	10	23	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	3531		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	3531		1770	1583
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	37	652	840	12	28	50
RTOR Reduction (vph)	0	0	1	0	0	36
Lane Group Flow (vph)	37	652	851	0	28	14
Confl. Peds. (#/hr)				1	9	
Confl. Bikes (#/hr)				1		
Turn Type	Prot					Perm
Protected Phases	5	2	6		3	
Permitted Phases						3
Actuated Green, G (s)	2.1	23.6	26.3		16.0	16.0
Effective Green, g (s)	2.1	23.6	26.3		16.0	16.0
Actuated g/C Ratio	0.04	0.40	0.45		0.27	0.27
Clearance Time (s)	4.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	2.0	2.0		3.0	3.0
Lane Grp Cap (vph)	64	1430	1590		485	434
v/s Ratio Prot	c0.02	0.18	c0.24		c0.02	
v/s Ratio Perm						0.01
v/c Ratio	0.58	0.46	0.54		0.06	0.03
Uniform Delay, d1	27.7	12.7	11.6		15.6	15.5
Progression Factor	1.34	0.46	1.00		1.00	1.00
Incremental Delay, d2	11.6	0.1	0.2		0.1	0.0
Delay (s)	48.6	6.0	11.8		15.7	15.6
Level of Service	D	A	B		B	B
Approach Delay (s)		8.3	11.8		15.6	
Approach LOS		A	B		B	

Intersection Summary			
HCM Average Control Delay	10.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	58.4	Sum of lost time (s)	14.0
Intersection Capacity Utilization	39.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	48	506	687	362	47	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.0	5.0		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.95		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	3294		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	3294		1770	1583
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	56	595	808	426	55	12
RTOR Reduction (vph)	0	0	55	0	0	10
Lane Group Flow (vph)	56	595	1179	0	55	2
Confl. Peds. (#/hr)				19	24	
Confl. Bikes (#/hr)				1		
Turn Type	Prot					Perm
Protected Phases	1	6	2		3	
Permitted Phases						3
Actuated Green, G (s)	4.4	42.7	33.8		8.4	8.4
Effective Green, g (s)	4.4	42.7	33.8		8.4	8.4
Actuated g/C Ratio	0.07	0.70	0.56		0.14	0.14
Clearance Time (s)	4.5	5.0	5.0		4.5	4.5
Vehicle Extension (s)	3.0	2.0	2.0		3.0	3.0
Lane Grp Cap (vph)	129	2494	1837		245	219
v/s Ratio Prot	c0.03	0.17	c0.36		c0.03	
v/s Ratio Perm						0.00
v/c Ratio	0.43	0.24	0.64		0.22	0.01
Uniform Delay, d1	26.9	3.2	9.2		23.2	22.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.3	0.0	0.6		0.5	0.0
Delay (s)	29.2	3.2	9.8		23.7	22.5
Level of Service	C	A	A		C	C
Approach Delay (s)		5.4	9.8		23.5	
Approach LOS		A	A		C	

Intersection Summary			
HCM Average Control Delay	8.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	60.6	Sum of lost time (s)	14.0
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	501	22	67	969	120	58	12	141	25	2	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		0.97	1.00	
Frt	1.00	0.99		1.00	0.98			0.91		1.00	0.87	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1770	3517		1770	3481			1672		3433	1626	
Flt Permitted	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (perm)	1770	3517		1770	3481			1672		3433	1626	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	35	619	27	83	1196	148	72	15	174	31	2	11
RTOR Reduction (vph)	0	2	0	0	6	0	0	61	0	0	11	0
Lane Group Flow (vph)	35	644	0	83	1338	0	0	200	0	31	2	0
Turn Type	Prot			Prot			Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases												
Actuated Green, G (s)	3.8	39.0		7.6	42.8			15.6		3.5	3.5	
Effective Green, g (s)	3.8	39.0		7.6	42.8			15.6		3.5	3.5	
Actuated g/C Ratio	0.05	0.47		0.09	0.52			0.19		0.04	0.04	
Clearance Time (s)	4.0	5.0		4.0	5.0			4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	81	1659		163	1802			315		145	69	
v/s Ratio Prot	0.02	0.18		c0.05	c0.38			c0.12		c0.01	0.00	
v/s Ratio Perm												
v/c Ratio	0.43	0.39		0.51	0.74			0.64		0.21	0.04	
Uniform Delay, d1	38.4	14.1		35.8	15.6			30.9		38.3	38.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	3.7	0.2		2.5	1.7			4.2		0.7	0.2	
Delay (s)	42.1	14.3		38.3	17.3			35.1		39.0	38.2	
Level of Service	D	B		D	B			D		D	D	
Approach Delay (s)		15.7			18.5			35.1			38.8	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	19.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	82.7	Sum of lost time (s)	17.0
Intersection Capacity Utilization	66.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	230	248	273	827	0	321	0	217	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		4.0	5.0		4.0		4.0			
Lane Util. Factor		0.95		1.00	0.95		1.00		1.00			
Frt		0.92		1.00	1.00		1.00		0.85			
Flt Protected		1.00		0.95	1.00		0.95		1.00			
Satd. Flow (prot)		3264		1770	3539		1770		1583			
Flt Permitted		1.00		0.95	1.00		0.95		1.00			
Satd. Flow (perm)		3264		1770	3539		1770		1583			
Peak-hour factor, PHF	0.92	0.95	0.95	0.95	0.95	0.92	0.95	0.92	0.95	0.92	0.92	0.92
Adj. Flow (vph)	0	242	261	287	871	0	338	0	228	0	0	0
RTOR Reduction (vph)	0	205	0	0	0	0	0	0	158	0	0	0
Lane Group Flow (vph)	0	298	0	287	871	0	338	0	70	0	0	0
Turn Type	Perm			Prot			Prot		custom			
Protected Phases		2		1	6		3					
Permitted Phases	2								3			
Actuated Green, G (s)		9.9		9.3	23.2		14.2		14.2			
Effective Green, g (s)		9.9		9.3	23.2		14.2		14.2			
Actuated g/C Ratio		0.21		0.20	0.50		0.31		0.31			
Clearance Time (s)		5.0		4.0	5.0		4.0		4.0			
Vehicle Extension (s)		3.0		3.0	3.0		3.0		3.0			
Lane Grp Cap (vph)		696		355	1770		542		484			
v/s Ratio Prot		0.09		c0.16	c0.25		c0.19					
v/s Ratio Perm									0.04			
v/c Ratio		0.43		0.81	0.49		0.62		0.14			
Uniform Delay, d1		15.8		17.7	7.7		13.8		11.7			
Progression Factor		1.00		1.00	1.00		1.00		1.00			
Incremental Delay, d2		0.4		12.7	0.2		2.2		0.1			
Delay (s)		16.2		30.4	7.9		16.0		11.8			
Level of Service		B		C	A		B		B			
Approach Delay (s)		16.2			13.5			14.3			0.0	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM Average Control Delay	14.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	46.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	253	327	124	491	541	211	120	545	199
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0		4.0	4.2		4.0	4.2	
Lane Util. Factor					0.95		0.97	0.91		1.00	0.95	
Frt					0.97		1.00	0.96		1.00	0.96	
Flt Protected					0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					3385		3433	4871		1770	3397	
Flt Permitted					0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)					3385		3433	4871		1770	3397	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	258	334	127	501	552	215	122	556	203
RTOR Reduction (vph)	0	0	0	0	0	0	0	51	0	0	20	0
Lane Group Flow (vph)	0	0	0	0	719	0	501	716	0	122	739	0
Turn Type				Split			Prot			Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)					33.1		24.7	72.5		12.2	60.0	
Effective Green, g (s)					33.1		24.7	72.5		12.2	60.0	
Actuated g/C Ratio					0.25		0.19	0.56		0.09	0.46	
Clearance Time (s)					4.0		4.0	4.2		4.0	4.2	
Vehicle Extension (s)					3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)					862		652	2717		166	1568	
v/s Ratio Prot					c0.21		c0.15	0.15		0.07	c0.22	
v/s Ratio Perm												
v/c Ratio					0.83		0.77	0.26		0.73	0.47	
Uniform Delay, d1					45.9		49.9	14.9		57.3	24.1	
Progression Factor					1.00		0.99	1.30		1.00	1.00	
Incremental Delay, d2					7.0		5.3	0.2		15.5	1.0	
Delay (s)					52.8		54.6	19.6		72.8	25.1	
Level of Service					D		D	B		E	C	
Approach Delay (s)		0.0			52.8			33.4			31.7	
Approach LOS		A			D			C			C	

Intersection Summary			
HCM Average Control Delay	37.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	87	141	219	0	0	225	0	728	277	177	863	274
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0			3.5		3.5	3.5	3.0	3.5	4.0
Lane Util. Factor		0.95	1.00			1.00		0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.99			1.00		1.00	0.99	1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85			0.86		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00			1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3473	1575			1611		3539	1560	3433	3539	1541
Flt Permitted		0.98	1.00			1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3473	1575			1611		3539	1560	3433	3539	1541
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	92	148	231	0	0	237	0	766	292	186	908	288
RTOR Reduction (vph)	0	0	71	0	0	55	0	0	100	0	0	0
Lane Group Flow (vph)	0	240	160	0	0	182	0	766	192	186	908	288
Confl. Peds. (#/hr)			1			1			1			3
Confl. Bikes (#/hr)			2			2			2			14
Turn Type	Split		custom			custom			custom	Prot		Free
Protected Phases	4!	4	5			2 6 4!		2 11!		1	6 11	
Permitted Phases			4						2			Free
Actuated Green, G (s)		15.0	41.0			99.9		93.2	66.6	12.3	76.0	130.0
Effective Green, g (s)		15.0	41.0			96.9		93.2	66.6	12.3	76.0	130.0
Actuated g/C Ratio		0.12	0.32			0.75		0.72	0.51	0.09	0.58	1.00
Clearance Time (s)		3.0	3.0						3.5	3.0		
Vehicle Extension (s)		3.0	3.0						5.0	3.0		
Lane Grp Cap (vph)		401	497			1201		2537	799	325	2069	1541
v/s Ratio Prot		c0.07	0.06			0.11		c0.22		c0.05	c0.26	
v/s Ratio Perm			0.04						0.12			0.19
v/c Ratio		0.60	0.32			0.15		0.30	0.24	0.57	0.44	0.19
Uniform Delay, d1		54.6	33.9			4.8		6.6	17.6	56.3	15.1	0.0
Progression Factor		1.00	1.00			1.00		0.66	0.76	1.12	0.95	1.00
Incremental Delay, d2		2.4	0.4			0.1		0.1	0.7	2.3	0.1	0.3
Delay (s)		57.0	34.3			4.8		4.4	14.0	65.7	14.5	0.3
Level of Service		E	C			A		A	B	E	B	A
Approach Delay (s)		45.9			4.8			7.1			18.5	
Approach LOS		D			A			A			B	

Intersection Summary			
HCM Average Control Delay	17.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	51.1%	ICU Level of Service	A
Analysis Period (min)	15		
! Phase conflict between lane groups.			
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	83	0	8	1	0	16	6	893	1	5	997	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1	5.1		5.1		5.1	5.1		5.1	5.1	
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.91	
Frt	1.00	1.00	0.85		0.87		1.00	1.00		1.00	0.99	
Flt Protected	0.95	0.95	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1681	1583		1621		1770	3539		1770	5032	
Flt Permitted	0.95	0.95	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1681	1583		1621		1770	3539		1770	5032	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	0	9	1	0	17	7	971	1	5	1084	82
RTOR Reduction (vph)	0	0	9	0	17	0	0	0	0	0	3	0
Lane Group Flow (vph)	45	45	0	0	1	0	7	972	0	5	1163	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases			4									
Actuated Green, G (s)	6.8	6.8	6.8		2.4		1.2	98.6		1.8	99.2	
Effective Green, g (s)	6.8	6.8	6.8		2.4		1.2	98.6		1.8	99.2	
Actuated g/C Ratio	0.05	0.05	0.05		0.02		0.01	0.76		0.01	0.76	
Clearance Time (s)	5.1	5.1	5.1		5.1		5.1	5.1		5.1	5.1	
Vehicle Extension (s)	1.7	1.7	1.7		1.7		1.7	2.2		1.7	2.2	
Lane Grp Cap (vph)	88	88	83		30		16	2684		25	3840	
v/s Ratio Prot	c0.03	0.03			c0.00		0.00	c0.27		0.00	c0.23	
v/s Ratio Perm			0.00									
v/c Ratio	0.51	0.51	0.01		0.04		0.44	0.36		0.20	0.30	
Uniform Delay, d1	60.0	60.0	58.4		62.7		64.1	5.2		63.4	4.7	
Progression Factor	1.00	1.00	1.00		1.00		0.94	1.09		0.95	0.75	
Incremental Delay, d2	2.1	2.1	0.0		0.2		5.2	0.3		1.3	0.2	
Delay (s)	62.1	62.1	58.4		62.9		65.4	6.0		61.8	3.8	
Level of Service	E	E	E		E		E	A		E	A	
Approach Delay (s)		61.7			62.9			6.4			4.0	
Approach LOS		E			E			A			A	

Intersection Summary			
HCM Average Control Delay	8.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	162	267	185	685	489	105	205	19	187	377	459
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	0.97		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3127		1770	3539	1559	1770	3490		3433	1863	1562
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3127		1770	3539	1559	1770	3490		3433	1863	1562
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	241	186	307	213	787	562	121	236	22	215	433	528
RTOR Reduction (vph)	0	194	0	0	0	257	0	5	0	0	0	230
Lane Group Flow (vph)	241	299	0	213	787	306	121	253	0	215	433	298
Confl. Peds. (#/hr)			8			2			1			1
Confl. Bikes (#/hr)			2			1						
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	20.4	44.0		20.9	44.5	44.5	8.9	31.8		12.1	35.0	35.0
Effective Green, g (s)	20.4	44.0		20.9	44.5	44.5	8.9	31.8		12.1	35.0	35.0
Actuated g/C Ratio	0.16	0.34		0.16	0.34	0.34	0.07	0.24		0.09	0.27	0.27
Clearance Time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Vehicle Extension (s)	3.0	2.2		3.0	2.2	2.2	3.0	2.2		3.0	2.2	2.2
Lane Grp Cap (vph)	278	1058		285	1211	534	121	854		320	502	421
v/s Ratio Prot	c0.14	0.10		0.12	c0.22		c0.07	0.07		0.06	c0.23	
v/s Ratio Perm						0.20						0.19
v/c Ratio	0.87	0.28		0.75	0.65	0.57	1.00	0.30		0.67	0.86	0.71
Uniform Delay, d1	53.5	31.4		52.0	36.2	35.0	60.5	40.0		57.0	45.2	42.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.16	0.94	1.03
Incremental Delay, d2	23.5	0.7		10.2	2.7	4.4	81.8	0.1		5.4	13.7	4.5
Delay (s)	77.0	32.1		62.2	38.9	39.4	142.4	40.1		71.3	56.0	48.6
Level of Service	E	C		E	D	D	F	D		E	E	D
Approach Delay (s)		46.8			42.2			72.7			55.5	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM Average Control Delay	50.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.7
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	377	14	0	1188	0	56	0	2	2	0	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0			5.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95			0.95			1.00	1.00		1.00	
Frt	1.00	0.99			1.00			1.00	0.85		0.89	
Flt Protected	0.95	1.00			1.00			0.95	1.00		0.99	
Satd. Flow (prot)	1770	3520			3539			1770	1583		1645	
Flt Permitted	0.95	1.00			1.00			0.75	1.00		0.94	
Satd. Flow (perm)	1770	3520			3539			1399	1583		1565	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	1	433	16	0	1366	0	64	0	2	2	0	8
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	2	0	7	0
Lane Group Flow (vph)	1	448	0	0	1366	0	0	64	0	0	3	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		
Actuated Green, G (s)	1.0	73.7			68.7			7.3	7.3		7.3	
Effective Green, g (s)	1.0	73.7			68.7			7.3	7.3		7.3	
Actuated g/C Ratio	0.01	0.82			0.76			0.08	0.08		0.08	
Clearance Time (s)	4.0	5.0			5.0			4.0	4.0		4.0	
Vehicle Extension (s)	1.5	2.5			2.5			1.5	1.5		1.5	
Lane Grp Cap (vph)	20	2882			2701			113	128		127	
v/s Ratio Prot	0.00	c0.13			c0.39							
v/s Ratio Perm								c0.05	0.00		0.00	
v/c Ratio	0.05	0.16			0.51			0.57	0.00		0.02	
Uniform Delay, d1	44.0	1.7			4.1			39.8	38.0		38.1	
Progression Factor	1.00	1.00			1.00			1.00	1.00		1.00	
Incremental Delay, d2	0.4	0.1			0.7			3.8	0.0		0.0	
Delay (s)	44.4	1.8			4.8			43.7	38.0		38.1	
Level of Service	D	A			A			D	D		D	
Approach Delay (s)		1.9			4.8			43.5			38.1	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	5.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	51	40	311	44	82	727
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	62	49	379	54	100	887
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1493	406			433	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1493	406			433	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	50	92			91	
cM capacity (veh/h)	124	645			1127	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	111	433	987
Volume Left	62	0	100
Volume Right	49	54	0
cSH	192	1700	1127
Volume to Capacity	0.58	0.25	0.09
Queue Length 95th (ft)	78	0	7
Control Delay (s)	46.7	0.0	2.3
Lane LOS	E		A
Approach Delay (s)	46.7	0.0	2.3
Approach LOS	E		

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	310	52	87	945	75	56	132	28	108	294	388
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	0.98		1.00	0.99			0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	1.00
Satd. Flow (prot)	1770	3462		1770	3500			1807			1838	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.99			0.99	1.00
Satd. Flow (perm)	1770	3462		1770	3500			1807			1838	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	337	57	95	1027	82	61	143	30	117	320	422
RTOR Reduction (vph)	0	12	0	0	6	0	0	6	0	0	0	295
Lane Group Flow (vph)	163	382	0	95	1103	0	0	228	0	0	437	127
Turn Type	Prot			Prot			Split			Split		custom
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												6
Actuated Green, G (s)	6.0	25.3		7.8	27.1			16.4			24.5	27.1
Effective Green, g (s)	6.0	25.3		7.8	27.1			16.4			24.5	27.1
Actuated g/C Ratio	0.07	0.28		0.09	0.30			0.18			0.27	0.30
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	118	973		153	1054			329			500	477
v/s Ratio Prot	c0.09	0.11		0.05	c0.32			c0.13			c0.24	
v/s Ratio Perm												0.08
v/c Ratio	1.38	0.39		0.62	1.05			0.69			0.87	0.27
Uniform Delay, d1	42.0	26.1		39.7	31.4			34.4			31.3	23.9
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	215.6	0.3		7.6	40.8			6.2			15.5	0.3
Delay (s)	257.6	26.4		47.3	72.3			40.7			46.8	24.2
Level of Service	F	C		D	E			D			D	C
Approach Delay (s)		94.1			70.3			40.7			35.7	
Approach LOS		F			E			D			D	

Intersection Summary			
HCM Average Control Delay	62.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	870	0	767	0	0	0	0	498	26	0	209	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5		3.5					5.0			5.0	4.0
Lane Util. Factor	0.97		1.00					0.91			0.95	1.00
Frt	1.00		0.85					0.99			1.00	0.85
Flt Protected	0.95		1.00					1.00			1.00	1.00
Satd. Flow (prot)	3433		1583					5047			3539	1583
Flt Permitted	0.95		1.00					1.00			1.00	1.00
Satd. Flow (perm)	3433		1583					5047			3539	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	897	0	791	0	0	0	0	513	27	0	215	112
RTOR Reduction (vph)	0	0	190	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	897	0	601	0	0	0	0	540	0	0	215	112
Turn Type	Prot		custom									Free
Protected Phases	4		4					2			6	
Permitted Phases												Free
Actuated Green, G (s)	31.5		31.5					14.2			14.2	54.2
Effective Green, g (s)	31.5		31.5					14.2			14.2	54.2
Actuated g/C Ratio	0.58		0.58					0.26			0.26	1.00
Clearance Time (s)	3.5		3.5					5.0			5.0	
Vehicle Extension (s)	4.0		4.0					4.0			4.0	
Lane Grp Cap (vph)	1995		920					1322			927	1583
v/s Ratio Prot	0.26		c0.38					c0.11			0.06	
v/s Ratio Perm												0.07
v/c Ratio	0.45		0.65					0.41			0.23	0.07
Uniform Delay, d1	6.4		7.7					16.5			15.7	0.0
Progression Factor	1.00		1.00					1.00			1.00	1.00
Incremental Delay, d2	0.2		1.9					0.3			0.2	0.1
Delay (s)	6.7		9.5					16.8			15.9	0.1
Level of Service	A		A					B			B	A
Approach Delay (s)		8.0			0.0			16.8			10.5	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	10.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	54.2	Sum of lost time (s)	8.5
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	22	2	75	22	360	2	133	77	703	213	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	6.0		5.5	6.0	6.0	5.5	7.0		5.5	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	0.97	0.95		0.97	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.94		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3498		1770	3539	1583	3433	3344		3433	3422	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3498		1770	3539	1583	3433	3344		3433	3422	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	33	24	2	82	24	396	2	146	85	773	234	66
RTOR Reduction (vph)	0	2	0	0	0	344	0	67	0	0	15	0
Lane Group Flow (vph)	33	24	0	82	24	52	2	164	0	773	285	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	2.7	4.6		7.2	9.1	9.1	1.1	14.8		18.6	32.3	
Effective Green, g (s)	2.7	4.6		7.2	9.1	9.1	1.1	14.8		18.6	32.3	
Actuated g/C Ratio	0.04	0.07		0.10	0.13	0.13	0.02	0.21		0.27	0.47	
Clearance Time (s)	5.5	6.0		5.5	6.0	6.0	5.5	7.0		5.5	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	4.5		3.0	4.5	
Lane Grp Cap (vph)	69	233		184	465	208	55	715		923	1597	
v/s Ratio Prot	0.02	0.01		c0.05	0.01		0.00	c0.05		c0.23	0.08	
v/s Ratio Perm						c0.03						
v/c Ratio	0.48	0.10		0.45	0.05	0.25	0.04	0.23		0.84	0.18	
Uniform Delay, d1	32.6	30.4		29.1	26.3	27.0	33.5	22.5		23.9	10.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.1	0.2		1.7	0.0	0.6	0.3	0.3		6.7	0.1	
Delay (s)	37.7	30.6		30.8	26.3	27.6	33.8	22.8		30.6	10.8	
Level of Service	D	C		C	C	C	C	C		C	B	
Approach Delay (s)		34.6			28.1			22.9			25.1	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	25.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	69.2	Sum of lost time (s)	24.0
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	771	24	32	430	0	16	0	28	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	5.0	6.0		5.0		5.0			
Lane Util. Factor		0.95	1.00	1.00	0.95		1.00		1.00			
Frt		1.00	0.85	1.00	1.00		1.00		0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (prot)		3539	1583	1770	3539		1770		1583			
Flt Permitted		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (perm)		3539	1583	1770	3539		1770		1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	838	26	35	467	0	17	0	30	0	0	0
RTOR Reduction (vph)	0	0	11	0	0	0	0	0	29	0	0	0
Lane Group Flow (vph)	0	838	15	35	467	0	17	0	1	0	0	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2						4			
Actuated Green, G (s)		24.6	24.6	2.4	32.0		1.0		1.0			
Effective Green, g (s)		24.6	24.6	2.4	32.0		1.0		1.0			
Actuated g/C Ratio		0.56	0.56	0.05	0.73		0.02		0.02			
Clearance Time (s)		6.0	6.0	5.0	6.0		5.0		5.0			
Vehicle Extension (s)		2.0	2.0	3.0	2.0		3.0		3.0			
Lane Grp Cap (vph)		1979	885	97	2574		40		36			
v/s Ratio Prot		c0.24		0.02	c0.13		c0.01					
v/s Ratio Perm			0.01						0.00			
v/c Ratio		0.42	0.02	0.36	0.18		0.42		0.02			
Uniform Delay, d1		5.6	4.3	20.1	1.9		21.2		21.0			
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00			
Incremental Delay, d2		0.1	0.0	2.3	0.0		7.1		0.2			
Delay (s)		5.7	4.3	22.3	1.9		28.3		21.2			
Level of Service		A	A	C	A		C		C			
Approach Delay (s)		5.6			3.3			23.8			0.0	
Approach LOS		A			A			C			A	

Intersection Summary			
HCM Average Control Delay	5.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	44.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	693	107	40	426	42	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		5.0	6.0	5.0	5.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3468		1770	3539	1770	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3468		1770	3539	1770	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	762	118	44	468	46	29
RTOR Reduction (vph)	12	0	0	0	0	27
Lane Group Flow (vph)	868	0	44	468	46	2
Turn Type			Prot			Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	27.8		2.6	35.4	4.0	4.0
Effective Green, g (s)	27.8		2.6	35.4	4.0	4.0
Actuated g/C Ratio	0.55		0.05	0.70	0.08	0.08
Clearance Time (s)	6.0		5.0	6.0	5.0	5.0
Vehicle Extension (s)	4.0		3.0	4.0	3.0	3.0
Lane Grp Cap (vph)	1913		91	2486	140	126
v/s Ratio Prot	c0.25		c0.02	0.13	c0.03	
v/s Ratio Perm						0.00
v/c Ratio	0.45		0.48	0.19	0.33	0.02
Uniform Delay, d1	6.8		23.2	2.6	21.9	21.4
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2		4.0	0.1	1.4	0.1
Delay (s)	7.0		27.3	2.6	23.3	21.4
Level of Service	A		C	A	C	C
Approach Delay (s)	7.0			4.7	22.6	
Approach LOS	A			A	C	

Intersection Summary			
HCM Average Control Delay	7.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	50.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	598	96	101	471	44	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	0.98		1.00	1.00	0.91	
Flt Protected	1.00		0.95	1.00	0.98	
Satd. Flow (prot)	3466		1770	3539	1673	
Flt Permitted	1.00		0.95	1.00	0.98	
Satd. Flow (perm)	3466		1770	3539	1673	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	650	104	110	512	48	83
RTOR Reduction (vph)	12	0	0	0	69	0
Lane Group Flow (vph)	742	0	110	512	62	0
Turn Type			Prot			
Protected Phases	2		1		7	
Permitted Phases				6		
Actuated Green, G (s)	22.6		6.2	25.7	8.6	
Effective Green, g (s)	22.6		6.2	25.7	8.6	
Actuated g/C Ratio	0.43		0.12	0.49	0.16	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Vehicle Extension (s)	2.0		3.0	2.0	3.0	
Lane Grp Cap (vph)	1495		209	1736	275	
v/s Ratio Prot	c0.21		c0.06		c0.04	
v/s Ratio Perm				c0.14		
v/c Ratio	0.50		0.53	0.29	0.22	
Uniform Delay, d1	10.8		21.7	8.0	19.0	
Progression Factor	1.00		1.52	0.25	1.00	
Incremental Delay, d2	0.1		2.3	0.0	0.4	
Delay (s)	10.9		35.4	2.0	19.4	
Level of Service	B		D	A	B	
Approach Delay (s)	10.9			7.9	19.4	
Approach LOS	B			A	B	

Intersection Summary			
HCM Average Control Delay	10.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	52.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	67	608	539	12	177	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	3525		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	3525		1770	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	71	647	573	13	188	35
RTOR Reduction (vph)	0	0	2	0	0	29
Lane Group Flow (vph)	71	647	584	0	188	6
Confl. Peds. (#/hr)				10	20	
Confl. Bikes (#/hr)				2		
Turn Type	Prot					Perm
Protected Phases	5	2	6		3	
Permitted Phases						3
Actuated Green, G (s)	4.1	22.6	25.7		8.6	8.6
Effective Green, g (s)	4.1	22.6	25.7		8.6	8.6
Actuated g/C Ratio	0.08	0.43	0.49		0.16	0.16
Clearance Time (s)	4.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	2.0	2.0		3.0	3.0
Lane Grp Cap (vph)	138	1526	1729		290	260
v/s Ratio Prot	c0.04	c0.18	c0.17		c0.11	
v/s Ratio Perm						0.00
v/c Ratio	0.51	0.42	0.34		0.65	0.02
Uniform Delay, d1	23.2	10.4	8.2		20.5	18.4
Progression Factor	1.37	0.32	1.00		1.00	1.00
Incremental Delay, d2	2.9	0.1	0.0		4.9	0.0
Delay (s)	34.7	3.4	8.2		25.4	18.4
Level of Service	C	A	A		C	B
Approach Delay (s)		6.5	8.2		24.3	
Approach LOS		A	A		C	

Intersection Summary			
HCM Average Control Delay	9.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	52.4	Sum of lost time (s)	19.0
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	34	734	475	150	383	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.0	5.0		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.96		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	3387		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	3387		1770	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	36	781	505	160	407	86
RTOR Reduction (vph)	0	0	37	0	0	55
Lane Group Flow (vph)	36	781	628	0	407	31
Confl. Peds. (#/hr)				5	15	
Confl. Bikes (#/hr)				2		
Turn Type	Prot					Perm
Protected Phases	1	6	2		3	
Permitted Phases						3
Actuated Green, G (s)	2.1	22.5	15.9		18.0	18.0
Effective Green, g (s)	2.1	22.5	15.9		18.0	18.0
Actuated g/C Ratio	0.04	0.45	0.32		0.36	0.36
Clearance Time (s)	4.5	5.0	5.0		4.5	4.5
Vehicle Extension (s)	3.0	2.0	2.0		3.0	3.0
Lane Grp Cap (vph)	74	1593	1077		637	570
v/s Ratio Prot	0.02	c0.22	c0.19		c0.23	
v/s Ratio Perm						0.02
v/c Ratio	0.49	0.49	0.58		0.64	0.05
Uniform Delay, d1	23.4	9.7	14.3		13.3	10.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	5.0	0.1	0.5		2.1	0.0
Delay (s)	28.4	9.8	14.8		15.4	10.5
Level of Service	C	A	B		B	B
Approach Delay (s)		10.6	14.8		14.6	
Approach LOS		B	B		B	

Intersection Summary			
HCM Average Control Delay	13.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	1002	57	144	553	103	22	13	104	224	23	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		0.97	1.00	
Frt	1.00	0.99		1.00	0.98			0.90		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1770	3511		1770	3456			1662		3433	1667	
Flt Permitted	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (perm)	1770	3511		1770	3456			1662		3433	1667	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	1055	60	152	582	108	23	14	109	236	24	56
RTOR Reduction (vph)	0	3	0	0	10	0	0	98	0	0	49	0
Lane Group Flow (vph)	29	1112	0	152	680	0	0	48	0	236	31	0
Turn Type	Prot			Prot			Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases												
Actuated Green, G (s)	4.2	38.4		12.5	46.7			8.8		11.8	11.8	
Effective Green, g (s)	4.2	38.4		12.5	46.7			8.8		11.8	11.8	
Actuated g/C Ratio	0.05	0.43		0.14	0.53			0.10		0.13	0.13	
Clearance Time (s)	4.0	5.0		4.0	5.0			4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	84	1523		250	1824			165		458	222	
v/s Ratio Prot	0.02	c0.32		c0.09	0.20			c0.03		c0.07	0.02	
v/s Ratio Perm												
v/c Ratio	0.35	0.73		0.61	0.37			0.29		0.52	0.14	
Uniform Delay, d1	40.8	20.8		35.7	12.3			37.0		35.7	33.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	2.5	1.8		4.1	0.1			1.0		1.0	0.3	
Delay (s)	43.3	22.6		39.8	12.4			37.9		36.7	34.2	
Level of Service	D	C		D	B			D		D	C	
Approach Delay (s)		23.1			17.4			37.9			36.0	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM Average Control Delay	23.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	88.5	Sum of lost time (s)	17.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	480	334	303	282	0	392	0	532	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		4.0	5.0		4.0		4.0			
Lane Util. Factor		0.95		1.00	0.95		1.00		1.00			
Frt		0.94		1.00	1.00		1.00		0.85			
Flt Protected		1.00		0.95	1.00		0.95		1.00			
Satd. Flow (prot)		3321		1770	3539		1770		1583			
Flt Permitted		1.00		0.95	1.00		0.95		1.00			
Satd. Flow (perm)		3321		1770	3539		1770		1583			
Peak-hour factor, PHF	0.92	0.96	0.96	0.96	0.96	0.92	0.96	0.92	0.96	0.92	0.92	0.92
Adj. Flow (vph)	0	500	348	316	294	0	408	0	554	0	0	0
RTOR Reduction (vph)	0	134	0	0	0	0	0	0	387	0	0	0
Lane Group Flow (vph)	0	714	0	316	294	0	408	0	167	0	0	0
Turn Type	Perm			Prot			Prot		custom			
Protected Phases		2		1	6		3					
Permitted Phases	2								3			
Actuated Green, G (s)		23.4		18.8	46.2		23.5		23.5			
Effective Green, g (s)		23.4		18.8	46.2		23.5		23.5			
Actuated g/C Ratio		0.30		0.24	0.59		0.30		0.30			
Clearance Time (s)		5.0		4.0	5.0		4.0		4.0			
Vehicle Extension (s)		3.0		3.0	3.0		3.0		3.0			
Lane Grp Cap (vph)		987		423	2078		529		473			
v/s Ratio Prot		c0.22		c0.18	0.08		c0.23					
v/s Ratio Perm									0.11			
v/c Ratio		0.72		0.75	0.14		0.77		0.35			
Uniform Delay, d1		24.8		27.7	7.3		25.2		21.6			
Progression Factor		1.00		1.00	1.00		1.00		1.00			
Incremental Delay, d2		2.7		7.1	0.0		6.9		0.5			
Delay (s)		27.4		34.8	7.3		32.0		22.1			
Level of Service		C		C	A		C		C			
Approach Delay (s)		27.4			21.6			26.3			0.0	
Approach LOS		C			C			C			A	

Intersection Summary			
HCM Average Control Delay	25.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	78.7	Sum of lost time (s)	13.0
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	156	165	77	282	1146	723	135	579	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0		4.0	4.2		4.0	4.2	
Lane Util. Factor					0.95		0.97	0.91		1.00	0.95	
Frt					0.97		1.00	0.94		1.00	0.97	
Flt Protected					0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					3371		3433	4790		1770	3424	
Flt Permitted					0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)					3371		3433	4790		1770	3424	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	162	172	80	294	1194	753	141	603	167
RTOR Reduction (vph)	0	0	0	0	0	0	0	72	0	0	10	0
Lane Group Flow (vph)	0	0	0	0	414	0	294	1875	0	141	760	0
Turn Type				Split			Prot			Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)					21.5		16.6	79.6		16.7	79.7	
Effective Green, g (s)					21.5		16.6	79.6		16.7	79.7	
Actuated g/C Ratio					0.17		0.13	0.61		0.13	0.61	
Clearance Time (s)					4.0		4.0	4.2		4.0	4.2	
Vehicle Extension (s)					3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)					558		438	2933		227	2099	
v/s Ratio Prot					c0.12		c0.09	c0.39		0.08	0.22	
v/s Ratio Perm												
v/c Ratio					0.74		0.67	0.64		0.62	0.36	
Uniform Delay, d1					51.6		54.1	16.1		53.7	12.5	
Progression Factor					1.00		0.88	1.03		1.00	1.00	
Incremental Delay, d2					5.3		3.6	1.0		5.2	0.5	
Delay (s)					56.9		51.4	17.5		58.9	13.0	
Level of Service					E		D	B		E	B	
Approach Delay (s)		0.0			56.9			22.0			20.1	
Approach LOS		A			E			C			C	

Intersection Summary			
HCM Average Control Delay	25.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	103	202	566	0	0	844	0	928	206	129	773	271
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0			3.5		3.5	3.5	3.0	3.5	4.0
Lane Util. Factor		0.95	1.00			1.00		0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.99			1.00		1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85			0.86		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00			1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3480	1574			1611		3539	1554	3433	3539	1535
Flt Permitted		0.98	1.00			1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3480	1574			1611		3539	1554	3433	3539	1535
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	107	210	590	0	0	879	0	967	215	134	805	282
RTOR Reduction (vph)	0	0	80	0	0	35	0	0	65	0	0	0
Lane Group Flow (vph)	0	317	510	0	0	844	0	967	150	134	805	282
Confl. Peds. (#/hr)						2			2			11
Confl. Bikes (#/hr)			1			5			5			14
Turn Type	Split		custom			custom			custom	Prot		Free
Protected Phases	4!	4	5			2 6 4!		2 11!		1	6 11	
Permitted Phases			4						2			Free
Actuated Green, G (s)		24.2	50.2			99.7		85.9	59.1	10.4	66.8	130.0
Effective Green, g (s)		24.2	50.2			96.7		85.9	59.1	10.4	66.8	130.0
Actuated g/C Ratio		0.19	0.39			0.74		0.66	0.45	0.08	0.51	1.00
Clearance Time (s)		3.0	3.0						3.5	3.0		
Vehicle Extension (s)		3.0	3.0						5.0	3.0		
Lane Grp Cap (vph)		648	608			1198		2338	706	275	1819	1535
v/s Ratio Prot		0.09	c0.17			c0.52		c0.27		0.04	0.23	
v/s Ratio Perm			0.16						0.10			0.18
v/c Ratio		0.49	0.84			0.70		0.41	0.21	0.49	0.44	0.18
Uniform Delay, d1		47.4	36.2			9.0		10.3	21.4	57.2	19.9	0.0
Progression Factor		1.00	1.00			1.00		0.59	1.61	1.02	0.69	1.00
Incremental Delay, d2		0.6	9.8			1.9		0.1	0.7	1.3	0.2	0.3
Delay (s)		47.9	46.0			10.9		6.2	35.1	59.7	13.9	0.3
Level of Service		D	D			B		A	D	E	B	A
Approach Delay (s)		46.7			10.9			11.5			15.8	
Approach LOS		D			B			B			B	

Intersection Summary			
HCM Average Control Delay	20.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	96.7%	ICU Level of Service	F
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	280	0	75	0	1	3	20	825	0	2	1163	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1	5.1		5.1		5.1	5.1		5.1	5.1	
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.91	
Frt	1.00	1.00	0.85		0.90		1.00	1.00		1.00	0.98	
Flt Protected	0.95	0.95	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1681	1583		1674		1770	3539		1770	4994	
Flt Permitted	0.95	0.95	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1681	1583		1674		1770	3539		1770	4994	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	304	0	82	0	1	3	22	897	0	2	1264	171
RTOR Reduction (vph)	0	0	72	0	3	0	0	0	0	0	9	0
Lane Group Flow (vph)	152	152	10	0	1	0	22	897	0	2	1426	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases			4									
Actuated Green, G (s)	16.4	16.4	16.4		1.0		4.1	90.4		1.8	88.1	
Effective Green, g (s)	16.4	16.4	16.4		1.0		4.1	90.4		1.8	88.1	
Actuated g/C Ratio	0.13	0.13	0.13		0.01		0.03	0.70		0.01	0.68	
Clearance Time (s)	5.1	5.1	5.1		5.1		5.1	5.1		5.1	5.1	
Vehicle Extension (s)	1.7	1.7	1.7		1.7		1.7	2.2		1.7	2.2	
Lane Grp Cap (vph)	212	212	200		13		56	2461		25	3384	
v/s Ratio Prot	c0.09	0.09			c0.00		0.01	c0.25		0.00	c0.29	
v/s Ratio Perm			0.01									
v/c Ratio	0.72	0.72	0.05		0.08		0.39	0.36		0.08	0.42	
Uniform Delay, d1	54.6	54.6	50.0		64.0		61.7	8.1		63.3	9.5	
Progression Factor	1.00	1.00	1.00		1.00		0.62	1.90		0.87	0.75	
Incremental Delay, d2	9.2	9.2	0.0		0.9		0.1	0.0		0.4	0.3	
Delay (s)	63.8	63.8	50.0		65.0		38.5	15.3		55.3	7.4	
Level of Service	E	E	D		E		D	B		E	A	
Approach Delay (s)		60.9			65.0			15.9			7.5	
Approach LOS		E			E			B			A	

Intersection Summary			
HCM Average Control Delay	17.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.4
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	384	787	116	26	262	272	187	196	110	750	175	331
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	0.99		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3456		1770	3539	1557	1770	3328		3433	1863	1562
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3456		1770	3539	1557	1770	3328		3433	1863	1562
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	422	865	127	29	288	299	205	215	121	824	192	364
RTOR Reduction (vph)	0	8	0	0	0	236	0	60	0	0	0	236
Lane Group Flow (vph)	422	984	0	29	288	63	205	276	0	824	192	128
Confl. Peds. (#/hr)			6			1			3			1
Confl. Bikes (#/hr)						3						
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	18.9	41.4		5.0	27.5	27.5	16.6	26.5		35.9	45.8	45.8
Effective Green, g (s)	18.9	41.4		5.0	27.5	27.5	16.6	26.5		35.9	45.8	45.8
Actuated g/C Ratio	0.15	0.32		0.04	0.21	0.21	0.13	0.20		0.28	0.35	0.35
Clearance Time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Vehicle Extension (s)	3.0	2.2		3.0	2.2	2.2	3.0	2.2		3.0	2.2	2.2
Lane Grp Cap (vph)	257	1101		68	749	329	226	678		948	656	550
v/s Ratio Prot	c0.24	c0.28		0.02	0.08		0.12	c0.08		c0.24	0.10	
v/s Ratio Perm						0.04						0.08
v/c Ratio	1.64	0.89		0.43	0.38	0.19	0.91	0.41		0.87	0.29	0.23
Uniform Delay, d1	55.5	42.2		61.1	44.0	42.1	55.9	44.9		44.8	30.4	29.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		0.86	0.69	1.87
Incremental Delay, d2	305.8	11.1		4.3	0.2	0.1	35.4	0.2		10.2	1.1	0.9
Delay (s)	361.4	53.3		65.4	44.2	42.3	91.3	45.1		48.6	22.1	56.4
Level of Service	F	D		E	D	D	F	D		D	C	E
Approach Delay (s)		145.3			44.2			62.6			47.0	
Approach LOS		F			D			E			D	

Intersection Summary			
HCM Average Control Delay	83.9	HCM Level of Service	F
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.7
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	1601	37	3	542	3	17	0	5	1	0	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.99	
Satd. Flow (prot)	1770	3527		1770	3537			1770	1583		1653	
Flt Permitted	0.95	1.00		0.95	1.00			1.00	1.00		0.91	
Satd. Flow (perm)	1770	3527		1770	3537			1863	1583		1521	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	1740	40	3	589	3	18	0	5	1	0	3
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	5	0	3	0
Lane Group Flow (vph)	7	1780	0	3	592	0	0	18	0	0	1	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		
Actuated Green, G (s)	1.1	93.2		1.0	93.1			2.8	2.8		2.8	
Effective Green, g (s)	1.1	93.2		1.0	93.1			2.8	2.8		2.8	
Actuated g/C Ratio	0.01	0.85		0.01	0.85			0.03	0.03		0.03	
Clearance Time (s)	4.0	5.0		4.0	5.0			4.0	4.0		4.0	
Vehicle Extension (s)	1.5	2.5		1.5	2.5			1.5	1.5		1.5	
Lane Grp Cap (vph)	18	2988		16	2994			47	40		39	
v/s Ratio Prot	c0.00	c0.50		0.00	0.17							
v/s Ratio Perm								c0.01	0.00		0.00	
v/c Ratio	0.39	0.60		0.19	0.20			0.38	0.00		0.03	
Uniform Delay, d1	54.1	2.6		54.1	1.6			52.7	52.2		52.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	5.0	0.9		2.1	0.1			1.9	0.0		0.1	
Delay (s)	59.1	3.5		56.2	1.7			54.6	52.3		52.4	
Level of Service	E	A		E	A			D	D		D	
Approach Delay (s)		3.7			2.0			54.1			52.4	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	3.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	11	41	424	54	29	252
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	13	47	487	62	33	290
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	875	518			549	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	875	518			549	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	92			97	
cM capacity (veh/h)	309	557			1020	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	60	549	323
Volume Left	13	0	33
Volume Right	47	62	0
cSH	477	1700	1020
Volume to Capacity	0.13	0.32	0.03
Queue Length 95th (ft)	11	0	3
Control Delay (s)	13.6	0.0	1.2
Lane LOS	B		A
Approach Delay (s)	13.6	0.0	1.2
Approach LOS	B		

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	47.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	168	871	81	30	337	97	57	240	57	49	169	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	0.99		1.00	0.97			0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	1.00
Satd. Flow (prot)	1770	3494		1770	3420			1808			1842	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.99			0.99	1.00
Satd. Flow (perm)	1770	3494		1770	3420			1808			1842	1583
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	185	957	89	33	370	107	63	264	63	54	186	65
RTOR Reduction (vph)	0	6	0	0	24	0	0	6	0	0	0	50
Lane Group Flow (vph)	185	1040	0	33	453	0	0	384	0	0	240	15
Turn Type	Prot			Prot			Split			Split		custom
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												6
Actuated Green, G (s)	14.5	34.0		2.1	21.6			23.8			17.8	21.6
Effective Green, g (s)	14.5	34.0		2.1	21.6			23.8			17.8	21.6
Actuated g/C Ratio	0.15	0.36		0.02	0.23			0.25			0.19	0.23
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	274	1268		40	788			459			350	365
v/s Ratio Prot	c0.10	c0.30		0.02	0.13			c0.21			c0.13	
v/s Ratio Perm												0.01
v/c Ratio	0.68	0.82		0.82	0.58			0.84			0.69	0.04
Uniform Delay, d1	37.4	27.1		45.6	32.0			33.1			35.3	28.0
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	6.4	4.3		76.6	1.0			12.5			5.5	0.0
Delay (s)	43.8	31.3		122.2	33.0			45.6			40.8	28.1
Level of Service	D	C		F	C			D			D	C
Approach Delay (s)		33.2			38.8			45.6			38.1	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	37.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	93.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

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--------------------------------------------------------------------------------
                          Pittsburg/Baypoint BART
                           Existing Plus Project
                               AM Peak Hour
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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #1 Willow Pass Rd./SR 4 EB Ramps
********************************************************************************
Cycle (sec):          180                 Critical Vol./Cap.(X):         0.451
Loss Time (sec):        0                 Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         42                 Level Of Service:                  A
********************************************************************************
Street Name:          Willow Pass Rd.                     SR 4 EB Ramps
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected         Protected        Split Phase       Split Phase
Rights:           Include           Ignore           Include           Include
Min. Green:     0     0     0     0     0     0     0     0     0     0     0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        0  0  2  1  0    0  0  2  0  1    2  0  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1189    75     0  294   221   312    0   150     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1189    75     0  294   221   312    0   150     0    0     0
Added Vol:      0  112     0     0    0     0     0    0    74     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0 1301    75     0  294   221   312    0   224     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.88 0.88  0.88  0.88 0.88  0.88  0.88 0.88  0.88  0.88 0.88  0.88
PHF Volume:     0 1478    85     0  334   251   355    0   255     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1478    85     0  334   251   355    0   255     0    0     0
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0     0
RTOR Vol:       0 1478    85     0  334   251   355    0   255     0    0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0 1478    85     0  334   251   355    0   255     0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  0.91 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 2.84  0.16  0.00 2.00  1.00  2.00 0.00  1.00  0.00 0.00  0.00
Final Sat.:     0 4879   281     0 3440  1720  3127    0  1720     0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.30  0.30  0.00 0.10  0.15  0.11 0.00  0.15  0.00 0.00  0.00
Crit Volume:               521     0                             255        0
Crit Moves:               ****  ****                            ****
********************************************************************************
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                          Pittsburg/Baypoint BART
                           Existing Plus Project
                               AM Peak Hour
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                     Level Of Service Computation Report
                   CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #2 San Marco Blvd./W Leland Rd.
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.539
Loss Time (sec):       0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        49                Level Of Service:                  A
********************************************************************************
Street Name:          San Marco Blvd.                    W Leland Rd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        2  0  1  1  0    2  0  1  1  0    1  0  1  1  0    1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      10  393   139  204  223    17   84   24    16  189   21   793
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   10  393   139  204  223    17   84   24    16  189   21   793
Added Vol:      0    0     1   74    0     0    0    0     0    1    0   112
RTOR Adjust:    0    0     0    0    0     0    0    0     0    0    0  -526
Initial Fut:   10  393   140  278  223    17   84   24    16  190   21   379
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.82 0.82  0.82 0.82 0.82  0.82 0.82 0.82  0.82 0.82 0.82  0.82
PHF Volume:    12  479   171  339  272    21  102   29    20  232   26   462
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   12  479   171  339  272    21  102   29    20  232   26   462
RTOR Reduct:    0    0     0    0    0     0    0    0     0    0    0   186
RTOR Vol:      12  479   171  339  272    21  102   29    20  232   26   276
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   12  479   171  339  272    21  102   29    20  232   26   276
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:  0.91 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       2.00 1.47  0.53 2.00 1.86  0.14 1.00 1.20  0.80 1.00 2.00  1.00
Final Sat.:  3000 2433   867 3000 3066   234 1650 1980  1320 1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.20  0.20 0.11 0.09  0.09 0.06 0.01  0.01 0.14 0.01  0.17
Crit Volume:       325        170              102                         276
Crit Moves:       ****       ****             ****                        ****
********************************************************************************
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Pittsburg/Baypoint BART
Existing Plus Project
AM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #3 Alves Ranch Rd./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.432
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	40	Level Of Service:	A

Street Name:	Alves Ranch Rd.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Protected			Protected			Protected			Protected	
Rights:		Include			Include			Include			Include	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:		1 0 1 0 1			1 0 0 1 0			1 0 2 0 1			1 0 1 1 0	
Volume Module:												
Base Vol:	64	0	20	0	0	0	1	342	16	10	915	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	64	0	20	0	0	0	1	342	16	10	915	0
Added Vol:	0	0	1	0	0	0	0	75	0	1	113	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	64	0	21	0	0	0	1	417	16	11	1028	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
PHF Volume:	82	0	27	0	0	0	1	535	21	14	1318	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	82	0	27	0	0	0	1	535	21	14	1318	0
RTOR Reduct:	0	0	14	0	0	0	0	0	21	0	0	0
RTOR Vol:	82	0	13	0	0	0	1	535	0	14	1318	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	82	0	13	0	0	0	1	535	0	14	1318	0
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.00	1.00	1.00	1.00	0.00	1.00	2.00	1.00	1.00	2.00	0.00
Final Sat.:	1720	1720	1720	1720	1720	0	1720	3440	1720	1720	3440	0
Capacity Analysis Module:												
Vol/Sat:	0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.16	0.00	0.01	0.38	0.00
Crit Volume:	82				0		1				659	
Crit Moves:	****						****				****	

Pittsburg/Baypoint BART
Existing Plus Project
AM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #4 Woodhill Dr./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.435
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	40	Level Of Service:	A

Street Name:	Woodhill Dr.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	0	0 1	0 0	0	0 0	0 0	1	1 0	1 0	2	0 0
Volume Module:												
Base Vol:	164	0	42	0	0	0	0	307	57	20	756	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	164	0	42	0	0	0	0	307	57	20	756	0
Added Vol:	0	0	1	0	0	0	0	76	0	1	114	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	164	0	43	0	0	0	0	383	57	21	870	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
PHF Volume:	205	0	54	0	0	0	0	479	71	26	1088	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	205	0	54	0	0	0	0	479	71	26	1088	0
RTOR Reduct:	0	0	26	0	0	0	0	0	0	0	0	0
RTOR Vol:	205	0	28	0	0	0	0	479	71	26	1088	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	205	0	28	0	0	0	0	479	71	26	1088	0
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.74	0.26	1.00	2.00	0.00
Final Sat.:	1720	0	1720	0	0	0	0	2994	446	1720	3440	0
Capacity Analysis Module:												
Vol/Sat:	0.12	0.00	0.02	0.00	0.00	0.00	0.00	0.16	0.16	0.02	0.32	0.00
Crit Volume:	205				0		0				544	
Crit Moves:	****						****				****	

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                          Pittsburg/Baypoint BART
                           Existing Plus Project
                               AM Peak Hour
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                     Level Of Service Computation Report
                   CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #5 Southwood Dr./W Leland Rd.
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):        0.442
Loss Time (sec):        0               Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         33               Level Of Service:                 A
********************************************************************************
Street Name:               Southwood Dr.                     W Leland Rd.
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Protected         Protected
Rights:           Include          Include          Include           Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  1! 0  0   0  0  0  0  0   0  0  1  1  0   1  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     154    0   115    0    0     0    0  307    44   37  619     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse: 154    0   115    0    0     0    0  307    44   37  619     0
Added Vol:     0    0     1    0    0     0    0  142     0    1   73     0
PasserByVol:   0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut: 154    0   116    0    0     0    0  449    44   38  692     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.81 0.81  0.81 0.81 0.81  0.81 0.81 0.81  0.81 0.81 0.81  0.81
PHF Volume:   190    0   143    0    0     0    0  554    54   47  854     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  190    0   143    0    0     0    0  554    54   47  854     0
RTOR Reduct:    0    0     0    0    0     0    0    0     0    0    0     0
RTOR Vol:     190    0   143    0    0     0    0  554    54   47  854     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  190    0   143    0    0     0    0  554    54   47  854     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.57 0.00  0.43 0.00 0.00  0.00 0.00 1.82  0.18 1.00 2.00  0.00
Final Sat.:   981    0   739    0    0     0    0 3133   307 1720 3440     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.19 0.00  0.19 0.00 0.00  0.00 0.00 0.18  0.18 0.03 0.25  0.00
Crit Volume:             333    0                0                   427
Crit Moves:             ****                  ****                  ****
********************************************************************************
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Pittsburg/Baypoint BART
Existing Plus Project
AM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #6 West Bart Driveway/W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.285
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	26	Level Of Service:	A

Street Name:	West Bart Driveway						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0 0 0 0 0			1 0 0 0 1			1 0 2 0 0			0 0 1 1 0		
Volume Module:												
Base Vol:	0	0	0	46	0	34	0	422	0	0	622	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	46	0	34	0	422	0	0	622	0
Added Vol:	0	0	0	-23	0	7	30	113	0	0	67	10
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	23	0	41	30	535	0	0	689	10
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
PHF Volume:	0	0	0	28	0	50	37	652	0	0	840	12
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	28	0	50	37	652	0	0	840	12
RTOR Reduct:	0	0	0	0	0	37	0	0	0	0	0	0
RTOR Vol:	0	0	0	28	0	13	37	652	0	0	840	12
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	28	0	13	37	652	0	0	840	12
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	2.00	0.00	0.00	1.97	0.03
Final Sat.:	0	0	0	1720	0	1720	1720	3440	0	0	3391	49
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.02	0.00	0.01	0.02	0.19	0.00	0.00	0.25	0.25
Crit Volume:		0		28			37					426
Crit Moves:				****			****					****

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-------------------------------------------------------------------------------
                           Pittsburg/Baypoint BART
                            Existing Plus Project
                                AM Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
*******************************************************************************
Intersection #7 East Bart Driveway/W Leland Rd.
*******************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.424
Loss Time (sec):        0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         40                Level Of Service:                  A
*******************************************************************************
Street Name:        East Bart Driveway                 W Leland Rd.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  0  0  0   1  0  0  0  1   1  0  2  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0     0     0    0     0     0   58   407     0    0   621   186
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0     0     0    0     0     0   58   407     0    0   621   186
Added Vol:      0     0     0   47     0    10  -10    99     0    0    66   176
PasserByVol:    0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:    0     0     0   47     0    10   48   506     0    0   687   362
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.85 0.85  0.85 0.85 0.85  0.85 0.85 0.85  0.85 0.85 0.85  0.85
PHF Volume:     0     0     0   55     0    12   56   595     0    0   808   426
Reduct Vol:     0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:    0     0     0   55     0    12   56   595     0    0   808   426
RTOR Reduct:    0     0     0    0     0    12    0     0     0    0     0     0
RTOR Vol:       0     0     0   55     0     0   56   595     0    0   808   426
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    0     0     0   55     0     0   56   595     0    0   808   426
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 0.00  0.00 1.00 0.00  1.00 1.00 2.00  0.00 0.00 1.31  0.69
Final Sat.:     0     0     0 1720     0  1720 1720 3440     0    0 2253  1187
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.03 0.00  0.00 0.03 0.17  0.00 0.00 0.36  0.36
Crit Volume:          0          55               56                         617
Crit Moves:                    ****             ****                        ****
*******************************************************************************
```

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                         Pittsburg/Baypoint BART
                          Existing Plus Project
                              AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #8 Oak Hill Dr./W Leland Rd.
********************************************************************************
Cycle (sec):           90                 Critical Vol./Cap.(X):        0.597
Loss Time (sec):       16                 Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         70                 Level Of Service:                 A
********************************************************************************
Street Name:                Oak Hill Dr.                   W Leland Rd.
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Split Phase       Split Phase        Protected         Protected
Rights:            Include           Include           Include           Include
Min. Green:     0     0     0     0     0     0     0     0     0     0     0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        0  0  1! 0  0    2  0  0  1  0    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       58     0   141     0     0     0     0   383    22    67   737     0
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    58     0   141     0     0     0     0   383    22    67   737     0
Added Vol:       0    12     0    25     2     9    28   118     0     0   232   120
PasserByVol:     0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:    58    12   141    25     2     9    28   501    22    67   969   120
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.81 0.81  0.81  0.81 0.81  0.81  0.81 0.81  0.81  0.81 0.81  0.81
PHF Volume:     72    15   174    31     2    11    35   619    27    83  1196   148
Reduct Vol:      0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:    72    15   174    31     2    11    35   619    27    83  1196   148
RTOR Reduct:     0     0     0     0     0     0     0     0     0     0     0     0
RTOR Vol:       72    15   174    31     2    11    35   619    27    83  1196   148
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    72    15   174    31     2    11    35   619    27    83  1196   148
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:   1.00 1.00  1.00  0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:        0.27 0.06  0.67  2.00 0.18  0.82  1.00 1.92  0.08  1.00 1.78  0.22
Final Sat.:    454   94  1103  3000  300  1350  1650 3161   139  1650 2936   364
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.16 0.16  0.16  0.01 0.01  0.01  0.02 0.20  0.20  0.05 0.41  0.41
Crit Volume:         260         15                35                     672
Crit Moves:         ****       ****              ****                    ****
********************************************************************************
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-------------------------------------------------------------------------------
                           Pittsburg/Baypoint BART
                            Existing Plus Project
                                AM Peak Hour
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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
******************************************************************************
Intersection #9 Bailey Rd./Willow Pass Rd.
******************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):        0.515
Loss Time (sec):        0                Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         47                Level Of Service:                 A
******************************************************************************
Street Name:                Bailey Rd.                   Willow Pass Rd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        1  0  1  0  1   1  0  0  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     301    0   197    0    0     0    0  230   197  244  827     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  301    0   197    0    0     0    0  230   197  244  827     0
Added Vol:     20    0    20    0    0     0    0    0    51   29    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  321    0   217    0    0     0    0  230   248  273  827     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:   338    0   228    0    0     0    0  242   261  287  871     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  338    0   228    0    0     0    0  242   261  287  871     0
RTOR Reduct:    0    0   228    0    0     0    0    0     0    0    0     0
RTOR Vol:     338    0     0    0    0     0    0  242   261  287  871     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  338    0     0    0    0     0    0  242   261  287  871     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       1.00 1.00  1.00 1.00 1.00  0.00 1.00 1.00  1.00 1.00 2.00  0.00
Final Sat.:  1720 1720  1720 1720 1720     0 1720 1720  1720 1720 3440     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.20 0.00  0.00 0.00 0.00  0.00 0.00 0.14  0.15 0.17 0.25  0.00
Crit Volume:  338                 0                          261  287
Crit Moves:  ****                                           **** ****
******************************************************************************
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--------------------------------------------------------------------------------
                           Pittsburg/Baypoint BART
                            Existing Plus Project
                                AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #10 Bailey Rd./SR 4 WB Ramps-Canal Rd.
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):         0.590
Loss Time (sec):       0              Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        56              Level Of Service:                  A
********************************************************************************
Street Name:                Bailey Rd.              SR 4 WB Ramps-Canal Rd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include         Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        2  0  2  1  0   1  0  1  1  0   0  0  0  0  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     462  501   211  120  465   199    0    0     0  253  327   124
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  462  501   211  120  465   199    0    0     0  253  327   124
Added Vol:     29   40     0    0   80     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  491  541   211  120  545   199    0    0     0  253  327   124
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.98 0.98  0.98 0.98 0.98  0.98 0.98 0.98  0.98 0.98 0.98  0.98
PHF Volume:   501  552   215  122  556   203    0    0     0  258  334   127
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  501  552   215  122  556   203    0    0     0  258  334   127
RTOR Reduct:    0    0     0    0    0     0    0    0     0    0    0     0
RTOR Vol:     501  552   215  122  556   203    0    0     0  258  334   127
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  501  552   215  122  556   203    0    0     0  258  334   127
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  0.91 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       2.00 2.16  0.84 1.00 1.47  0.53 0.00 0.00  0.00 0.72 0.93  0.35
Final Sat.:  3127 3712  1448 1720 2520   920    0    0     0 1236 1598   606
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.16 0.15  0.15 0.07 0.22  0.22 0.00 0.00  0.00 0.21 0.21  0.21
Crit Volume:  251                        380         0               359
Crit Moves:  ****                       ****                        ****
********************************************************************************
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-------------------------------------------------------------------------------
                         Pittsburg/Baypoint BART
                          Existing Plus Project
                              AM Peak Hour
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
*******************************************************************************
Intersection #11 Bailey Rd./SR 4 EB Ramps-Bart
*******************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):        0.434
Loss Time (sec):       0               Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        40               Level Of Service:                 A
*******************************************************************************
Street Name:                Bailey Rd.                    SR 4 EB Ramps-Bart
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected         Protected        Split Phase       Split Phase
Rights:           Include           Ignore             Ovl              Ignore
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Y+R:          4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0
Lanes:        0  0  2  0  1    2  0  2  0  1    0  1  1  0  1    0  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0   681   256  177   623   445   65   109   165    0     0   225
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0   681   256  177   623   445   65   109   165    0     0   225
Added Vol:      0    47    21    0   240  -171   22    32    54    0     0     0
PasserByVol:    0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:    0   728   277  177   863   274   87   141   219    0     0   225
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:     0   766   292  186   908   288   92   148   231    0     0   237
Reduct Vol:     0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:    0   766   292  186   908   288   92   148   231    0     0   237
RTOR Reduct:    0     0     0    0     0     0    0     0     0    0     0     0
RTOR Vol:       0   766   292  186   908   288   92   148   231    0     0   237
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    0   766   292  186   908   288   92   148   231    0     0   237
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:  1.00 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 2.00  1.00 2.00 2.00  1.00 0.76 1.24  1.00 0.00 0.00  1.00
Final Sat.:     0 3300  1650 3000 3300  1650 1259 2041  1650    0     0  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.23  0.18 0.06 0.28  0.17 0.07 0.07  0.14 0.00 0.00  0.14
Crit Volume:      383          93                          231         0
Crit Moves:       ****       ****                         ****      ****
*******************************************************************************
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--------------------------------------------------------------------------------
                         Pittsburg/Baypoint BART
                          Existing Plus Project
                              AM Peak Hour
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                      Level Of Service Computation Report
                   CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #12 Bailey Rd./Maylard St.
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.339
Loss Time (sec):        0               Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         34               Level Of Service:                  A
********************************************************************************
Street Name:              Bailey Rd.                         Maylard St.
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected         Protected        Split Phase       Split Phase
Rights:           Include           Include           Include           Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Y+R:         4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0
Lanes:       1  0  1  1  0    1  0  2  1  0    1  1  0  0  1    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      6   825     1    5   703    75   83     0     8    1     0    16
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   6   825     1    5   703    75   83     0     8    1     0    16
Added Vol:     0    68     0    0   294     0    0     0     0    0     0     0
PasserByVol:   0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:   6   893     1    5   997    75   83     0     8    1     0    16
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92
PHF Volume:    7   971     1    5  1084    82   90     0     9    1     0    17
Reduct Vol:    0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:   7   971     1    5  1084    82   90     0     9    1     0    17
RTOR Reduct:   0     0     0    0     0     0    0     0     7    0     0     0
RTOR Vol:      7   971     1    5  1084    82   90     0     2    1     0    17
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   7   971     1    5  1084    82   90     0     2    1     0    17
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00
Lanes:       1.00 1.99  0.01 1.00 2.79  0.21 2.00 0.00  1.00 0.05 0.01  0.94
Final Sat.:  1650 3296     4 1650 4604   346 3000    0  1650   97     0  1553
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.29  0.29 0.00 0.24  0.24 0.03 0.00  0.00 0.01 0.00  0.01
Crit Volume:       486           5               45                          18
Crit Moves:        ****       ****             ****                        ****
********************************************************************************
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Pittsburg/Baypoint BART
Existing Plus Project
AM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #13 Bailey Rd./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.751
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	92	Level Of Service:	C

Street Name:	Bailey Rd.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1	1 0	2 0	1	0 1	1 0	1	1 0	1 0	2	0 1
Volume Module:												
Base Vol:	73	205	19	187	377	165	142	142	211	185	659	489
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	73	205	19	187	377	165	142	142	211	185	659	489
Added Vol:	32	0	0	0	0	294	68	20	56	0	26	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	105	205	19	187	377	459	210	162	267	185	685	489
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
PHF Volume:	121	236	22	215	433	528	241	186	307	213	787	562
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	121	236	22	215	433	528	241	186	307	213	787	562
RTOR Reduct:	0	0	0	0	0	241	0	0	0	0	0	118
RTOR Vol:	121	236	22	215	433	286	241	186	307	213	787	444
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	121	236	22	215	433	286	241	186	307	213	787	444
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.83	0.17	2.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00
Final Sat.:	1650	3020	280	3000	1650	1650	1650	1650	1650	1650	3300	1650
Capacity Analysis Module:												
Vol/Sat:	0.07	0.08	0.08	0.07	0.26	0.17	0.15	0.11	0.19	0.13	0.24	0.27
Crit Volume:	121				433		241					444
Crit Moves:	****				****		****					****

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                         Pittsburg/Baypoint BART
                          Existing Plus Project
                              AM Peak Hour
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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #14 Chestnut Dr./W Leland Rd.
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):         0.441
Loss Time (sec):       0              Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        33              Level Of Service:                  A
********************************************************************************
Street Name:             Chestnut Dr.                      W Leland Rd.
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted         Permitted         Protected         Protected
Rights:           Include           Include           Include           Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Y+R:         4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0
Lanes:        0  1  0  0  1    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     56     0     2    2     0     7    1   357    14    0  1162     0
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:  56     0     2    2     0     7    1   357    14    0  1162     0
Added Vol:     0     0     0    0     0     0    0    20     0    0    26     0
PasserByVol:   0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:  56     0     2    2     0     7    1   377    14    0  1188     0
User Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     0.87  0.87  0.87 0.87  0.87  0.87 0.87  0.87  0.87 0.87  0.87  0.87
PHF Volume:   64     0     2    2     0     8    1   433    16    0  1366     0
Reduct Vol:    0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:  64     0     2    2     0     8    1   433    16    0  1366     0
RTOR Reduct:   0     0     0    0     0     0    0     0     0    0     0     0
RTOR Vol:     64     0     2    2     0     8    1   433    16    0  1366     0
PCE Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:  64     0     2    2     0     8    1   433    16    0  1366     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720  1720
Adjustment:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Lanes:       1.00  0.00  1.00 0.22  0.00  0.78 1.00  1.93  0.07 1.00  2.00  0.00
Final Sat.:  1720     0  1720  382     0  1338 1720  3317   123 1720  3440     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04  0.00  0.00 0.01  0.00  0.01 0.00  0.13  0.13 0.00  0.40  0.00
Crit Volume:  64                           10    1                     683
Crit Moves:  ****                        ****  ****                    ****
********************************************************************************
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--------------------------------------------------------------------------------
                        Pittsburg/Baypoint BART
                         Existing Plus Project
                             AM Peak Hour
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                    Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #16 Bailey Rd./Concord Blvd.
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.842
Loss Time (sec):        0               Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        144               Level Of Service:                  D
********************************************************************************
Street Name:              Bailey Rd.                     Concord Blvd.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  1! 0  0   0  1  0  0  1   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      56  110    28    92  265   377   146  310    52    87  945    69
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   56  110    28    92  265   377   146  310    52    87  945    69
Added Vol:      0   22     0    16   29    11     4    0     0     0    0     6
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   56  132    28   108  294   388   150  310    52    87  945    75
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:    61  143    30   117  320   422   163  337    57    95 1027    82
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   61  143    30   117  320   422   163  337    57    95 1027    82
RTOR Reduct:    0    0     0     0    0   163     0    0     0     0    0     0
RTOR Vol:      61  143    30   117  320   259   163  337    57    95 1027    82
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   61  143    30   117  320   259   163  337    57    95 1027    82
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.26 0.61  0.13  0.27 0.73  1.00  1.00 1.71  0.29  1.00 1.85  0.15
Final Sat.:   428 1008   214   443 1207  1650  1650 2826   474  1650 3057   243
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.14 0.14  0.14  0.26 0.26  0.16  0.10 0.12  0.12  0.06 0.34  0.34
Crit Volume:       235              437         163                         554
Crit Moves:       ****             ****        ****                        ****
********************************************************************************
```

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                          Pittsburg/Baypoint BART
                           Existing Plus Project
                               AM Peak Hour
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                     Level Of Service Computation Report
                   CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #17 W Leland Rd./F St.
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.317
Loss Time (sec):        0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         33                Level Of Service:                  A
********************************************************************************
Street Name:                 F St.                         W Leland Rd.
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected         Protected         Protected         Protected
Rights:           Include           Include           Include           Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  0  0  0    1  0  0  0  1    1  0  2  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0     0    0    0     0    0  351     0    0  773     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0    0     0    0    0     0    0  351     0    0  773     0
Added Vol:      0    0     0   94    0    77   29   48     0    0   38    35
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    0    0     0   94    0    77   29  399     0    0  811    35
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:     0    0     0   94    0    77   29  399     0    0  811    35
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0     0   94    0    77   29  399     0    0  811    35
RTOR Reduct:    0    0     0    0    0    29    0    0     0    0    0     0
RTOR Vol:       0    0     0   94    0    48   29  399     0    0  811    35
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    0    0     0   94    0    48   29  399     0    0  811    35
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 0.00  0.00 1.00 0.00  1.00 1.00 2.00  0.00 0.00 1.92  0.08
Final Sat.:     0    0     0 1720    0  1720 1720 3440     0    0 3298   142
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.05 0.00  0.03 0.02 0.12  0.00 0.00 0.25  0.25
Crit Volume:         0          94                29                      423
Crit Moves:                   ****              ****                     ****
********************************************************************************
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------------------------------------------------------------------------------
                         Pittsburg/Baypoint BART
                          Existing Plus Project
                              PM Peak Hour
------------------------------------------------------------------------------

                   Level Of Service Computation Report
               CCTALOS Method (Future Volume Alternative)
******************************************************************************
Intersection #1 Willow Pass Rd./SR 4 EB Ramps
******************************************************************************
Cycle (sec):          180              Critical Vol./Cap.(X):        0.564
Loss Time (sec):        0              Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         52              Level Of Service:                 A
******************************************************************************
Street Name:          Willow Pass Rd.                   SR 4 EB Ramps
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Ignore          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  2  1  0   0  0  2  0  1   2  0  0  0  1   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  371    26    0  209   109  870    0   611    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0  371    26    0  209   109  870    0   611    0    0     0
Added Vol:     0  127     0    0    0     0    0    0   156    0    0     0
PasserByVol:   0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:   0  498    26    0  209   109  870    0   767    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.97 0.97  0.97 0.97 0.97  0.97 0.97 0.97  0.97 0.97 0.97  0.97
PHF Volume:    0  513    27    0  215   112  897    0   791    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0  513    27    0  215   112  897    0   791    0    0     0
RTOR Reduct:   0    0     0    0    0     0    0    0     0    0    0     0
RTOR Vol:      0  513    27    0  215   112  897    0   791    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   0  513    27    0  215   112  897    0   791    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 2.85  0.15 0.00 2.00  1.00 2.00 0.00  1.00 0.00 0.00  0.00
Final Sat.:    0 4904   256    0 3440  1720 3127    0  1720    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.10  0.10 0.00 0.06  0.07 0.29 0.00  0.46 0.00 0.00  0.00
Crit Volume:             180    0                           791         0
Crit Moves:             ****  ****                         ****
******************************************************************************
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Pittsburg/Baypoint BART
Existing Plus Project
PM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #2 San Marco Blvd./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.385
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	37	Level Of Service:	A

Street Name:	San Marco Blvd.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	2 0	1	1 0	2 0	1	1 0	1 0	1	1 0	1 0	2	0 1
Volume Module:												
Base Vol:	2	133	71	547	213	60	30	22	2	67	22	233
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	2	133	71	547	213	60	30	22	2	67	22	233
Added Vol:	0	0	6	156	0	0	0	0	0	8	0	127
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	2	133	77	703	213	60	30	22	2	75	22	360
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	2	146	85	773	234	66	33	24	2	82	24	396
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	2	146	85	773	234	66	33	24	2	82	24	396
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	396
RTOR Vol:	2	146	85	773	234	66	33	24	2	82	24	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	2	146	85	773	234	66	33	24	2	82	24	0
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	1.27	0.73	2.00	1.56	0.44	1.00	1.83	0.17	1.00	2.00	1.00
Final Sat.:	3000	2090	1210	3000	2575	725	1650	3025	275	1650	3300	1650
Capacity Analysis Module:												
Vol/Sat:	0.00	0.07	0.07	0.26	0.09	0.09	0.02	0.01	0.01	0.05	0.01	0.00
Crit Volume:		115		386					13	82		
Crit Moves:		****		****					****	****		

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                           Pittsburg/Baypoint BART
                            Existing Plus Project
                                PM Peak Hour
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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Alves Ranch Rd./W Leland Rd.
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.274
Loss Time (sec):        0               Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         31               Level Of Service:                  A
********************************************************************************
Street Name:          Alves Ranch Rd.                    W Leland Rd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        1  0  1  0  1   1  0  0  1  0   1  0  2  0  1   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      16    0    22    0    0     0    0  609    24   24  295     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   16    0    22    0    0     0    0  609    24   24  295     0
Added Vol:      0    0     6    0    0     0    0  162     0    8  135     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:   16    0    28    0    0     0    0  771    24   32  430     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92
PHF Volume:    17    0    30    0    0     0    0  838    26   35  467     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   17    0    30    0    0     0    0  838    26   35  467     0
RTOR Reduct:    0    0    30    0    0     0    0    0    17    0    0     0
RTOR Vol:      17    0     0    0    0     0    0  838     9   35  467     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   17    0     0    0    0     0    0  838     9   35  467     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       1.00 1.00  1.00 1.00 1.00  0.00 1.00 2.00  1.00 1.00 2.00  0.00
Final Sat.:  1720 1720  1720 1720 1720     0 1720 3440  1720 1720 3440     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01 0.00  0.00 0.00 0.00  0.00 0.00 0.24  0.01 0.02 0.14  0.00
Crit Volume:   17                  0              419         35
Crit Moves:  ****                                ****       ****
********************************************************************************
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--------------------------------------------------------------------------------
                           Pittsburg/Baypoint BART
                            Existing Plus Project
                                PM Peak Hour
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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #4 Woodhill Dr./W Leland Rd.
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.308
Loss Time (sec):        0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         33                Level Of Service:                  A
********************************************************************************
Street Name:                Woodhill Dr.                      W Leland Rd.
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase       Split Phase        Protected         Protected
Rights:           Include           Include           Include           Include
Min. Green:     0     0     0     0     0     0     0     0     0     0     0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        1  0  0  0  1    0  0  0  0  0    0  0  1  1  0    1  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      42     0    20     0     0     0     0   525   107    32   282     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   42     0    20     0     0     0     0   525   107    32   282     0
Added Vol:      0     0     6     0     0     0     0   168     0     8   144     0
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   42     0    26     0     0     0     0   693   107    40   426     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91
PHF Volume:    46     0    29     0     0     0     0   762   118    44   468     0
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   46     0    29     0     0     0     0   762   118    44   468     0
RTOR Reduct:    0     0    29     0     0     0     0     0     0     0     0     0
RTOR Vol:      46     0     0     0     0     0     0   762   118    44   468     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   46     0     0     0     0     0     0   762   118    44   468     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 0.00  1.00  0.00 0.00  0.00  0.00 1.73  0.27  1.00 2.00  0.00
Final Sat.:  1720    0  1720     0    0     0     0 2980   460  1720 3440     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.03 0.00  0.00  0.00 0.00  0.00  0.00 0.26  0.26  0.03 0.14  0.00
Crit Volume:   46                    0                440         44
Crit Moves:  ****                                    ****        ****
********************************************************************************
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Pittsburg/Baypoint BART
Existing Plus Project
PM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #5 Southwood Dr./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.359
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	29	Level Of Service:	A

Street Name:	Southwood Dr.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0 0	1!	0 0	0 0	0	0 0	0 0	1	1 0	1 0	2	0 0
Volume Module:												
Base Vol:	44	0	70	0	0	0	0	443	96	93	268	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	44	0	70	0	0	0	0	443	96	93	268	0
Added Vol:	0	0	6	0	0	0	0	155	0	8	203	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	44	0	76	0	0	0	0	598	96	101	471	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	48	0	83	0	0	0	0	650	104	110	512	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	48	0	83	0	0	0	0	650	104	110	512	0
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Vol:	48	0	83	0	0	0	0	650	104	110	512	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	48	0	83	0	0	0	0	650	104	110	512	0
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.37	0.00	0.63	0.00	0.00	0.00	0.00	1.72	0.28	1.00	2.00	0.00
Final Sat.:	631	0	1089	0	0	0	0	2964	476	1720	3440	0
Capacity Analysis Module:												
Vol/Sat:	0.08	0.00	0.08	0.00	0.00	0.00	0.00	0.22	0.22	0.06	0.15	0.00
Crit Volume:			130	0				377		110		
Crit Moves:			****					****		****		

Pittsburg/Baypoint BART
Existing Plus Project
PM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #6 West Bart Driveway/W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.321
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	27	Level Of Service:	A

Street Name:	West Bart Driveway						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0 0 0 0 0			1 0 0 0 1			1 0 2 0 0			0 0 1 1 0		
Volume Module:												
Base Vol:	0	0	0	450	0	77	0	513	0	0	284	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	450	0	77	0	513	0	0	284	0
Added Vol:	0	0	0	-273	0	-44	67	95	0	0	255	12
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	177	0	33	67	608	0	0	539	12
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	0	0	0	188	0	35	71	647	0	0	573	13
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	188	0	35	71	647	0	0	573	13
RTOR Reduct:	0	0	0	0	0	35	0	0	0	0	0	0
RTOR Vol:	0	0	0	188	0	0	71	647	0	0	573	13
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	188	0	0	71	647	0	0	573	13
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	2.00	0.00	0.00	1.96	0.04
Final Sat.:	0	0	0	1720	0	1720	1720	3440	0	0	3365	75
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.11	0.00	0.00	0.04	0.19	0.00	0.00	0.17	0.17
Crit Volume:		0		188			71					293
Crit Moves:				****			****					****

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                            Pittsburg/Baypoint BART
                             Existing Plus Project
                                 PM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
                   CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #7 East Bart Driveway/W Leland Rd.
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):        0.464
Loss Time (sec):       0              Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        43              Level Of Service:                 A
********************************************************************************
Street Name:         East Bart Driveway                  W Leland Rd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0     0     0     0     0     0     0     0     0     0     0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  0  0  0    1  0  0  0  1    1  0  2  0  0    0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0     0     0     0     0     0    36   912     0     0   285    97
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:    0     0     0     0     0     0    36   912     0     0   285    97
Added Vol:      0     0     0   383     0    81    -2  -178     0     0   190    53
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:    0     0     0   383     0    81    34   734     0     0   475   150
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94
PHF Volume:     0     0     0   407     0    86    36   781     0     0   505   160
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:    0     0     0   407     0    86    36   781     0     0   505   160
RTOR Reduct:    0     0     0     0     0    36     0     0     0     0     0     0
RTOR Vol:       0     0     0   407     0    50    36   781     0     0   505   160
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:    0     0     0   407     0    50    36   781     0     0   505   160
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720  1720  1720  1720  1720  1720  1720  1720  1720  1720  1720  1720
Adjustment:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       0.00  0.00  0.00  1.00  0.00  1.00  1.00  2.00  0.00  0.00  1.52  0.48
Final Sat.:     0     0     0  1720     0  1720  1720  3440     0     0  2614   826
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.00  0.24  0.00  0.03  0.02  0.23  0.00  0.00  0.19  0.19
Crit Volume:          0             407                     390          0
Crit Moves:                        ****                    ****       ****
********************************************************************************
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                        Pittsburg/Baypoint BART
                         Existing Plus Project
                             PM Peak Hour
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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #8 Oak Hill Dr./W Leland Rd.
********************************************************************************
Cycle (sec):          90                Critical Vol./Cap.(X):         0.597
Loss Time (sec):      16                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        70                Level Of Service:                  A
********************************************************************************
Street Name:            Oak Hill Dr.                     W Leland Rd.
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase       Split Phase        Protected         Protected
Rights:           Include           Include           Include           Include
Min. Green:     0     0     0     0     0     0     0     0     0     0     0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        0  0  1! 0  0    2  0  0  1  0    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      22     0   104     0     0     0     0   825    57   144   363     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   22     0   104     0     0     0     0   825    57   144   363     0
Added Vol:      0    13     0   224    23    53    28   177     0     0   190   103
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   22    13   104   224    23    53    28  1002    57   144   553   103
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:    23    14   109   236    24    56    29  1055    60   152   582   108
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   23    14   109   236    24    56    29  1055    60   152   582   108
RTOR Reduct:    0     0     0     0     0     0     0     0     0     0     0     0
RTOR Vol:      23    14   109   236    24    56    29  1055    60   152   582   108
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   23    14   109   236    24    56    29  1055    60   152   582   108
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.16 0.09  0.75  2.00 0.30  0.70  1.00 1.89  0.11  1.00 1.69  0.31
Final Sat.:   261  154  1235  3000  499  1151  1650 3122   178  1650 2782   518
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.09 0.09  0.09  0.08 0.05  0.05  0.02 0.34  0.34  0.09 0.21  0.21
Crit Volume:       146         118                     557         152
Crit Moves:        ****        ****                    ****        ****
********************************************************************************
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                          Pittsburg/Baypoint BART
                           Existing Plus Project
                               PM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
                   CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #9 Bailey Rd./Willow Pass Rd.
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):        0.667
Loss Time (sec):        0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         69                Level Of Service:                  B
********************************************************************************
Street Name:                Bailey Rd.                    Willow Pass Rd.
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Split Phase       Split Phase        Protected         Protected
Rights:            Include           Include           Include           Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        1  0  1  0  1    1  0  0  1  0    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     325    0   465    0    0     0    0  480   279  248  282     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  325    0   465    0    0     0    0  480   279  248  282     0
Added Vol:     67    0    67    0    0     0    0    0    55   55    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  392    0   532    0    0     0    0  480   334  303  282     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96 0.96 0.96  0.96 0.96 0.96  0.96 0.96 0.96  0.96
PHF Volume:   408    0   554    0    0     0    0  500   348  316  294     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  408    0   554    0    0     0    0  500   348  316  294     0
RTOR Reduct:    0    0   316    0    0     0    0    0     0    0    0     0
RTOR Vol:     408    0   239    0    0     0    0  500   348  316  294     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  408    0   239    0    0     0    0  500   348  316  294     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       1.00 1.00  1.00 1.00 1.00  0.00 1.00 1.18  0.82 1.00 2.00  0.00
Final Sat.:  1720 1720  1720 1720 1720     0 1720 2029  1411 1720 3440     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.24 0.00  0.14 0.00 0.00  0.00 0.00 0.25  0.25 0.18 0.09  0.00
Crit Volume:  408                       0            424        316
Crit Moves:  ****                                   ****       ****
********************************************************************************
```

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                           Pittsburg/Baypoint BART
                            Existing Plus Project
                                PM Peak Hour
--------------------------------------------------------------------------------

                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #10 Bailey Rd./SR 4 WB Ramps-Canal Rd.
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.640
Loss Time (sec):        0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         63                Level Of Service:                  B
********************************************************************************
Street Name:                Bailey Rd.                SR 4 WB Ramps-Canal Rd.
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        2  0  2  1  0   1  0  1  1  0   0  0  0  0  0   0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     254 1013   723   135  469   160    0    0     0   156  165    77
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  254 1013   723   135  469   160    0    0     0   156  165    77
Added Vol:     28  133     0     0  110     0    0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0    0    0     0     0    0     0
Initial Fut:  282 1146   723   135  579   160    0    0     0   156  165    77
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:   294 1194   753   141  603   167    0    0     0   163  172    80
Reduct Vol:     0    0     0     0    0     0    0    0     0     0    0     0
Reduced Vol:  294 1194   753   141  603   167    0    0     0   163  172    80
RTOR Reduct:    0    0     0     0    0     0    0    0     0     0    0     0
RTOR Vol:     294 1194   753   141  603   167    0    0     0   163  172    80
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  294 1194   753   141  603   167    0    0     0   163  172    80
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:  0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       2.00 2.00  1.00  1.00 1.57  0.43  0.00 0.00  0.00  0.78 0.83  0.39
Final Sat.:  3127 3440  1720  1720 2695   745    0    0     0  1348 1426   666
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.09 0.35  0.44  0.08 0.22  0.22  0.00 0.00  0.00  0.12 0.12  0.12
Crit Volume:             753   141                      0              207
Crit Moves:             ****  ****                                     ****
********************************************************************************
```

Pittsburg/Baypoint BART
Existing Plus Project
PM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #11 Bailey Rd./SR 4 EB Ramps-Bart

Cycle (sec):	100	Critical Vol./Cap.(X):	0.695
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	75	Level Of Service:	B

Street Name:	Bailey Rd.						SR 4 EB Ramps-Bart					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Ignore			Ovl			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0 0	2 0	1	2 0	2 0	1	0 1	1 0	1	0 0	0 0	1
Volume Module:												
Base Vol:	0	759	98	129	628	235	111	185	542	0	0	844
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	759	98	129	628	235	111	185	542	0	0	844
Added Vol:	0	169	108	0	145	36	-8	17	24	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	928	206	129	773	271	103	202	566	0	0	844
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	0	967	215	134	805	282	107	210	590	0	0	879
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	967	215	134	805	282	107	210	590	0	0	879
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Vol:	0	967	215	134	805	282	107	210	590	0	0	879
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	967	215	134	805	282	107	210	590	0	0	879
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	2.00	1.00	2.00	2.00	1.00	0.68	1.32	1.00	0.00	0.00	1.00
Final Sat.:	0	3300	1650	3000	3300	1650	1114	2186	1650	0	0	1650
Capacity Analysis Module:												
Vol/Sat:	0.00	0.29	0.13	0.04	0.24	0.17	0.10	0.10	0.36	0.00	0.00	0.53
Crit Volume:		483		67					590		0	
Crit Moves:		****		****					****		****	

Pittsburg/Baypoint BART
Existing Plus Project
PM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #12 Bailey Rd./Maylard St.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.407
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	38	Level Of Service:	A

Street Name:	Bailey Rd.						Maylard St.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0 1 1 0			1 0 2 1 0			1 1 0 0 1			0 0 0 1 0		
Volume Module:												
Base Vol:	20	548	0	2	994	157	280	0	75	0	1	3
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	20	548	0	2	994	157	280	0	75	0	1	3
Added Vol:	0	277	0	0	169	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	20	825	0	2	1163	157	280	0	75	0	1	3
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	22	897	0	2	1264	171	304	0	82	0	1	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	22	897	0	2	1264	171	304	0	82	0	1	3
RTOR Reduct:	0	0	0	0	0	0	0	0	22	0	0	0
RTOR Vol:	22	897	0	2	1264	171	304	0	60	0	1	3
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	22	897	0	2	1264	171	304	0	60	0	1	3
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	0.00	1.00	2.64	0.36	2.00	0.00	1.00	0.00	0.25	0.75
Final Sat.:	1650	3300	0	1650	4361	589	3000	0	1650	0	413	1237
Capacity Analysis Module:												
Vol/Sat:	0.01	0.27	0.00	0.00	0.29	0.29	0.10	0.00	0.04	0.00	0.00	0.00
Crit Volume:	22					478	152					4
Crit Moves:	****					****	****					****

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                         Pittsburg/Baypoint BART
                          Existing Plus Project
                              PM Peak Hour
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                    Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
*******************************************************************************
Intersection #13 Bailey Rd./W Leland Rd.
*******************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):        0.720
Loss Time (sec):       0               Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        81               Level Of Service:                 C
*******************************************************************************
Street Name:              Bailey Rd.                      W Leland Rd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        1  0  1  1  0   2  0  1  0  1   1  0  1  1  0   1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     115  196   110  750  175   162  107  727    51   26  209   272
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  115  196   110  750  175   162  107  727    51   26  209   272
Added Vol:     72    0     0    0    0   169  277   60    65    0   53     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  187  196   110  750  175   331  384  787   116   26  262   272
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91 0.91 0.91  0.91 0.91 0.91  0.91 0.91 0.91  0.91
PHF Volume:   205  215   121  824  192   364  422  865   127   29  288   299
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  205  215   121  824  192   364  422  865   127   29  288   299
RTOR Reduct:    0    0     0    0    0   364    0    0     0    0    0   299
RTOR Vol:     205  215   121  824  192     0  422  865   127   29  288     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  205  215   121  824  192     0  422  865   127   29  288     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:  1.00 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       1.00 1.28  0.72 2.00 1.00  1.00 1.00 1.74  0.26 1.00 2.00  1.00
Final Sat.:  1650 2114  1186 3000 1650  1650 1650 2876   424 1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.12 0.10  0.10 0.27 0.12  0.00 0.26 0.30  0.30 0.02 0.09  0.00
Crit Volume:       168        412              422                   144
Crit Moves:       ****       ****             ****                  ****
*******************************************************************************
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Pittsburg/Baypoint BART
Existing Plus Project
PM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #14 Chestnut Dr./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.533
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	40	Level Of Service:	A

Street Name:	Chestnut Dr.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0 1 0 0 1			0 0 1! 0 0			1 0 1 1 0			1 0 1 1 0		
Volume Module:												
Base Vol:	17	0	5	1	0	3	6	1541	37	3	489	3
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	17	0	5	1	0	3	6	1541	37	3	489	3
Added Vol:	0	0	0	0	0	0	0	60	0	0	53	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	17	0	5	1	0	3	6	1601	37	3	542	3
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	18	0	5	1	0	3	7	1740	40	3	589	3
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	18	0	5	1	0	3	7	1740	40	3	589	3
RTOR Reduct:	0	0	3	0	0	0	0	0	0	0	0	0
RTOR Vol:	18	0	2	1	0	3	7	1740	40	3	589	3
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	18	0	2	1	0	3	7	1740	40	3	589	3
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.00	1.00	0.25	0.00	0.75	1.00	1.95	0.05	1.00	1.99	0.01
Final Sat.:	1720	0	1720	430	0	1290	1720	3362	78	1720	3421	19
Capacity Analysis Module:												
Vol/Sat:	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.52	0.00	0.17	0.17
Crit Volume:	18					4		890		3		
Crit Moves:	****					****		****		****		

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                         Pittsburg/Baypoint BART
                          Existing Plus Project
                              PM Peak Hour
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                     Level Of Service Computation Report
                   CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #16 Bailey Rd./Concord Blvd.
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.718
Loss Time (sec):       0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        81                Level Of Service:                  C
********************************************************************************
Street Name:              Bailey Rd.                      Concord Blvd.
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected         Protected
Rights:           Include          Include          Include           Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  1! 0  0   0  1  0  0  1   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      57  198    57   38  123    51  156  871    81   30  337    79
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   57  198    57   38  123    51  156  871    81   30  337    79
Added Vol:      0   42     0   11   46     8   12    0     0    0    0    18
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:   57  240    57   49  169    59  168  871    81   30  337    97
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91 0.91 0.91  0.91 0.91 0.91  0.91 0.91 0.91  0.91
PHF Volume:    63  264    63   54  186    65  185  957    89   33  370   107
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   63  264    63   54  186    65  185  957    89   33  370   107
RTOR Reduct:    0    0     0    0    0    65    0    0     0    0    0     0
RTOR Vol:      63  264    63   54  186     0  185  957    89   33  370   107
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   63  264    63   54  186     0  185  957    89   33  370   107
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.16 0.68  0.16 0.22 0.78  1.00 1.00 1.83  0.17 1.00 1.55  0.45
Final Sat.:   266 1119   266  371 1279  1650 1650 3019   281 1650 2562   738
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.24 0.24  0.24 0.15 0.15  0.00 0.11 0.32  0.32 0.02 0.14  0.14
Crit Volume:             389       240                     523   33
Crit Moves:             ****      ****                    **** ****
********************************************************************************
```

APPENDIX E:
EXISTING PLUS PROJECT MITIGATED LEVEL OF SERVICE CALCULATIONS SHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	162	267	185	685	489	105	205	19	187	377	459
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	0.97		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3127		1770	3539	1559	1770	3490		3433	1863	1562
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3127		1770	3539	1559	1770	3490		3433	1863	1562
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	241	186	307	213	787	562	121	236	22	215	433	528
RTOR Reduction (vph)	0	207	0	0	0	293	0	5	0	0	0	305
Lane Group Flow (vph)	241	286	0	213	787	269	121	253	0	215	433	223
Confl. Peds. (#/hr)			8			2			1			1
Confl. Bikes (#/hr)			2			1						
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	21.0	42.5		20.4	41.9	41.9	12.0	33.4		12.5	33.9	33.9
Effective Green, g (s)	21.0	42.5		20.4	41.9	41.9	12.0	33.4		12.5	33.9	33.9
Actuated g/C Ratio	0.16	0.33		0.16	0.32	0.32	0.09	0.26		0.10	0.26	0.26
Clearance Time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Vehicle Extension (s)	3.0	2.2		3.0	2.2	2.2	3.0	2.2		3.0	2.2	2.2
Lane Grp Cap (vph)	286	1022		278	1141	502	163	897		330	486	407
v/s Ratio Prot	c0.14	0.09		0.12	c0.22		c0.07	0.07		0.06	c0.23	
v/s Ratio Perm						0.17						0.14
v/c Ratio	0.84	0.28		0.77	0.69	0.54	0.74	0.28		0.65	0.89	0.55
Uniform Delay, d1	52.9	32.4		52.5	38.4	36.1	57.5	38.7		56.6	46.3	41.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.09	0.85	1.22
Incremental Delay, d2	19.6	0.7		11.9	3.4	4.1	16.6	0.1		4.5	17.7	0.9
Delay (s)	72.5	33.1		64.4	41.8	40.2	74.1	38.8		66.4	57.1	51.6
Level of Service	E	C		E	D	D	E	D		E	E	D
Approach Delay (s)		46.0			44.3			50.1			56.3	
Approach LOS		D			D			D			E	

Intersection Summary			
HCM Average Control Delay	48.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.7
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	384	787	116	26	262	272	187	196	110	750	175	331
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	0.99		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3456		1770	3539	1557	1770	3328		3433	1863	1562
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3456		1770	3539	1557	1770	3328		3433	1863	1562
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	422	865	127	29	288	299	205	215	121	824	192	364
RTOR Reduction (vph)	0	8	0	0	0	235	0	61	0	0	0	286
Lane Group Flow (vph)	422	984	0	29	288	64	205	275	0	824	192	78
Confl. Peds. (#/hr)			6			1			3			1
Confl. Bikes (#/hr)						3						
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	35.3	59.9		4.5	29.1	29.1	20.4	19.7		29.7	29.0	29.0
Effective Green, g (s)	35.3	59.9		4.5	29.1	29.1	20.4	19.7		29.7	29.0	29.0
Actuated g/C Ratio	0.26	0.44		0.03	0.22	0.22	0.15	0.15		0.22	0.21	0.21
Clearance Time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Vehicle Extension (s)	3.0	2.2		3.0	2.2	2.2	3.0	2.2		3.0	2.2	2.2
Lane Grp Cap (vph)	463	1533		59	763	336	267	486		755	400	336
v/s Ratio Prot	c0.24	c0.28		0.02	0.08		c0.12	0.08		c0.24	0.10	
v/s Ratio Perm						0.04						0.05
v/c Ratio	0.91	0.64		0.49	0.38	0.19	0.77	0.57		1.09	0.48	0.23
Uniform Delay, d1	48.3	29.2		64.1	45.2	43.3	55.0	53.7		52.6	46.4	43.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	22.1	2.1		6.3	0.2	0.1	12.4	1.0		60.5	4.1	1.6
Delay (s)	70.4	31.3		70.4	45.4	43.5	67.5	54.7		113.1	50.5	45.4
Level of Service	E	C		E	D	D	E	D		F	D	D
Approach Delay (s)		43.0			45.6			59.5			86.6	
Approach LOS		D			D			E			F	

Intersection Summary			
HCM Average Control Delay	60.9	HCM Level of Service	E
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	10.2
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Pittsburg/Baypoint BART
Existing Plus Project
AM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #13 Bailey Rd./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.718
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	81	Level Of Service:	C

Street Name:	Bailey Rd.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	2 0	1	1 0	2 0	1	0 1	1 0	1	1 0	1 0	2	0 1
Volume Module:												
Base Vol:	73	205	19	187	377	165	142	142	211	185	659	489
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	73	205	19	187	377	165	142	142	211	185	659	489
Added Vol:	32	0	0	0	0	294	68	20	56	0	26	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	105	205	19	187	377	459	210	162	267	185	685	489
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
PHF Volume:	121	236	22	215	433	528	241	186	307	213	787	562
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	121	236	22	215	433	528	241	186	307	213	787	562
RTOR Reduct:	0	0	0	0	0	241	0	0	0	0	0	118
RTOR Vol:	121	236	22	215	433	286	241	186	307	213	787	444
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	121	236	22	215	433	286	241	186	307	213	787	444
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	1.83	0.17	2.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00
Final Sat.:	3000	3020	280	3000	1650	1650	1650	1650	1650	1650	3300	1650
Capacity Analysis Module:												
Vol/Sat:	0.04	0.08	0.08	0.07	0.26	0.17	0.15	0.11	0.19	0.13	0.24	0.27
Crit Volume:	60				433		241					444
Crit Moves:	****				****		****					****

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                           Pittsburg/Baypoint BART
                            Existing Plus Project
                                PM Peak Hour
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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #13 Bailey Rd./W Leland Rd.
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):        0.720
Loss Time (sec):       0                Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        81                Level Of Service:                 C
********************************************************************************
Street Name:               Bailey Rd.                       W Leland Rd.
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        2  0  1  1  0   2  0  1  0  1   1  0  1  1  0   1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     115  196   110  750  175   162  107  727    51   26  209   272
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  115  196   110  750  175   162  107  727    51   26  209   272
Added Vol:     72    0     0    0    0   169  277   60    65    0   53     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  187  196   110  750  175   331  384  787   116   26  262   272
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91 0.91 0.91  0.91 0.91 0.91  0.91 0.91 0.91  0.91
PHF Volume:   205  215   121  824  192   364  422  865   127   29  288   299
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  205  215   121  824  192   364  422  865   127   29  288   299
RTOR Reduct:    0    0     0    0    0   364    0    0     0    0    0   299
RTOR Vol:     205  215   121  824  192     0  422  865   127   29  288     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  205  215   121  824  192     0  422  865   127   29  288     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:  0.91 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       2.00 1.28  0.72 2.00 1.00  1.00 1.00 1.74  0.26 1.00 2.00  1.00
Final Sat.:  3000 2114  1186 3000 1650  1650 1650 2876   424 1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.07 0.10  0.10 0.27 0.12  0.00 0.26 0.30  0.30 0.02 0.09  0.00
Crit Volume:       168        412              422                   144
Crit Moves:       ****       ****             ****                  ****
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APPENDIX F:
CUMULATIVE LEVEL OF SERVICE CALCULATION SHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	380	0	400	0	0	0	0	1990	280	0	470	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5		3.5					5.0			5.0	4.0
Lane Util. Factor	0.97		1.00					0.91			0.95	1.00
Frt	1.00		0.85					0.98			1.00	0.85
Flt Protected	0.95		1.00					1.00			1.00	1.00
Satd. Flow (prot)	3433		1583					4991			3539	1583
Flt Permitted	0.95		1.00					1.00			1.00	1.00
Satd. Flow (perm)	3433		1583					4991			3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	400	0	421	0	0	0	0	2095	295	0	495	295
RTOR Reduction (vph)	0	0	93	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	400	0	328	0	0	0	0	2390	0	0	495	295
Turn Type	Prot		custom									Free
Protected Phases	4		4					2			6	
Permitted Phases												Free
Actuated Green, G (s)	18.7		18.7					31.4			31.4	58.6
Effective Green, g (s)	18.7		18.7					31.4			31.4	58.6
Actuated g/C Ratio	0.32		0.32					0.54			0.54	1.00
Clearance Time (s)	3.5		3.5					5.0			5.0	
Vehicle Extension (s)	4.0		4.0					4.0			4.0	
Lane Grp Cap (vph)	1096		505					2674			1896	1583
v/s Ratio Prot	0.12		c0.21					c0.48			0.14	
v/s Ratio Perm												0.19
v/c Ratio	0.36		0.65					0.89			0.26	0.19
Uniform Delay, d1	15.4		17.1					12.1			7.3	0.0
Progression Factor	1.00		1.00					1.00			1.00	1.00
Incremental Delay, d2	0.3		3.2					4.4			0.1	0.3
Delay (s)	15.7		20.3					16.5			7.4	0.3
Level of Service	B		C					B			A	A
Approach Delay (s)		18.1			0.0			16.5			4.8	
Approach LOS		B			A			B			A	

Intersection Summary			
HCM Average Control Delay	14.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	58.6	Sum of lost time (s)	8.5
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	340	140	330	110	1050	60	910	350	300	510	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	6.0		5.5	6.0	6.0	5.5	7.0		5.5	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	0.97	0.95		0.97	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3385		1770	3539	1583	3433	3392		3433	3492	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3385		1770	3539	1583	3433	3392		3433	3492	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	221	358	147	347	116	1105	63	958	368	316	537	53
RTOR Reduction (vph)	0	32	0	0	0	497	0	29	0	0	5	0
Lane Group Flow (vph)	221	473	0	347	116	608	63	1297	0	316	585	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	18.5	27.0		26.5	35.0	35.0	5.6	49.9		12.7	57.0	
Effective Green, g (s)	18.5	27.0		26.5	35.0	35.0	5.6	49.9		12.7	57.0	
Actuated g/C Ratio	0.13	0.19		0.19	0.25	0.25	0.04	0.36		0.09	0.41	
Clearance Time (s)	5.5	6.0		5.5	6.0	6.0	5.5	7.0		5.5	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	4.5		3.0	4.5	
Lane Grp Cap (vph)	234	652		335	884	395	137	1208		311	1421	
v/s Ratio Prot	0.12	0.14		c0.20	0.03		0.02	c0.38		c0.09	0.17	
v/s Ratio Perm						c0.38						
v/c Ratio	0.94	0.73		1.04	0.13	1.54	0.46	1.07		1.02	0.41	
Uniform Delay, d1	60.3	53.1		56.8	40.8	52.5	65.8	45.1		63.7	29.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	43.3	4.0		58.7	0.1	255.5	2.4	48.1		55.2	0.3	
Delay (s)	103.6	57.1		115.5	40.8	308.0	68.2	93.2		118.9	29.9	
Level of Service	F	E		F	D	F	E	F		F	C	
Approach Delay (s)		71.2			245.7			92.1			61.0	
Approach LOS		E			F			F			E	

Intersection Summary			
HCM Average Control Delay	135.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	140.1	Sum of lost time (s)	24.0
Intersection Capacity Utilization	128.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	860	190	120	1520	0	200	0	210	100	0	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	5.0	6.0		5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00		1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00		0.85	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539		1770		1583	1770	1583	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539		1770		1583	1770	1583	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	905	200	126	1600	0	211	0	221	105	0	126
RTOR Reduction (vph)	0	0	114	0	0	0	0	0	185	0	113	0
Lane Group Flow (vph)	42	905	86	126	1600	0	211	0	36	105	13	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2						4			
Actuated Green, G (s)	3.9	40.4	40.4	10.9	47.4		12.1		13.2	9.0	10.1	
Effective Green, g (s)	3.9	40.4	40.4	10.9	47.4		12.1		13.2	9.0	10.1	
Actuated g/C Ratio	0.04	0.43	0.43	0.12	0.50		0.13		0.14	0.10	0.11	
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0		5.0		5.0	5.0	5.0	
Vehicle Extension (s)	3.0	2.0	2.0	3.0	2.0		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	73	1513	677	204	1775		227		221	169	169	
v/s Ratio Prot	0.02	0.26		c0.07	c0.45		c0.12			0.06	0.01	
v/s Ratio Perm			0.05						c0.02			
v/c Ratio	0.58	0.60	0.13	0.62	0.90		0.93		0.16	0.62	0.08	
Uniform Delay, d1	44.5	20.8	16.4	39.8	21.4		40.8		35.8	41.1	38.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2	10.5	0.4	0.0	5.5	6.6		40.2		0.3	6.9	0.2	
Delay (s)	55.0	21.2	16.4	45.3	28.0		81.0		36.1	48.0	38.2	
Level of Service	D	C	B	D	C		F		D	D	D	
Approach Delay (s)		21.6			29.3			58.0			42.7	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM Average Control Delay	31.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	94.5	Sum of lost time (s)	21.0
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1100	70	30	1460	180	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		5.0	6.0	5.0	5.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3507		1770	3539	1770	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3507		1770	3539	1770	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1158	74	32	1537	189	63
RTOR Reduction (vph)	5	0	0	0	0	52
Lane Group Flow (vph)	1227	0	32	1537	189	11
Turn Type			Prot			Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	37.1		3.0	45.1	11.7	11.7
Effective Green, g (s)	37.1		3.0	45.1	11.7	11.7
Actuated g/C Ratio	0.55		0.04	0.67	0.17	0.17
Clearance Time (s)	6.0		5.0	6.0	5.0	5.0
Vehicle Extension (s)	4.0		3.0	4.0	3.0	3.0
Lane Grp Cap (vph)	1919		78	2354	305	273
v/s Ratio Prot	0.35		0.02	c0.43	c0.11	
v/s Ratio Perm						0.01
v/c Ratio	0.64		0.41	0.65	0.62	0.04
Uniform Delay, d1	10.7		31.5	6.7	26.0	23.4
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8		3.5	0.7	3.7	0.1
Delay (s)	11.5		35.0	7.4	29.7	23.4
Level of Service	B		D	A	C	C
Approach Delay (s)	11.5			8.0	28.1	
Approach LOS	B			A	C	

Intersection Summary			
HCM Average Control Delay	11.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	67.8	Sum of lost time (s)	11.0
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1100	60	30	1300	190	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	0.99		1.00	1.00	0.94	
Flt Protected	1.00		0.95	1.00	0.97	
Satd. Flow (prot)	3512		1770	3539	1707	
Flt Permitted	1.00		0.95	1.00	0.97	
Satd. Flow (perm)	3512		1770	3539	1707	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1158	63	32	1368	200	147
RTOR Reduction (vph)	4	0	0	0	40	0
Lane Group Flow (vph)	1217	0	32	1368	307	0
Turn Type			Prot			
Protected Phases	2		1		7	
Permitted Phases				6		
Actuated Green, G (s)	33.6		2.9	41.5	16.8	
Effective Green, g (s)	33.6		2.9	41.5	16.8	
Actuated g/C Ratio	0.49		0.04	0.61	0.25	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Vehicle Extension (s)	2.0		3.0	2.0	3.0	
Lane Grp Cap (vph)	1728		75	2150	420	
v/s Ratio Prot	c0.35		0.02		c0.18	
v/s Ratio Perm				c0.39		
v/c Ratio	0.70		0.43	0.64	0.73	
Uniform Delay, d1	13.5		31.9	8.6	23.7	
Progression Factor	1.00		1.45	0.17	1.00	
Incremental Delay, d2	1.1		3.1	0.4	6.4	
Delay (s)	14.6		49.3	1.8	30.1	
Level of Service	B		D	A	C	
Approach Delay (s)	14.6			2.9	30.1	
Approach LOS	B			A	C	

Intersection Summary			
HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	68.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱
Volume (vph)	0	1240	1290	0	50	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0	5.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frpb, ped/bikes		1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	3539		1770	1583
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	3539		1770	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1305	1358	0	53	42
RTOR Reduction (vph)	0	0	0	0	0	21
Lane Group Flow (vph)	0	1305	1358	0	53	21
Confl. Peds. (#/hr)					9	
Turn Type						Perm
Protected Phases		2	6		3	
Permitted Phases						3
Actuated Green, G (s)		33.6	41.5		16.8	16.8
Effective Green, g (s)		33.6	41.5		16.8	16.8
Actuated g/C Ratio		0.49	0.61		0.25	0.25
Clearance Time (s)		5.0	5.0		5.0	5.0
Vehicle Extension (s)		2.0	2.0		3.0	3.0
Lane Grp Cap (vph)		1741	2150		435	389
v/s Ratio Prot		c0.37	c0.38		c0.03	
v/s Ratio Perm						0.01
v/c Ratio		0.75	0.63		0.12	0.05
Uniform Delay, d1		14.0	8.5		20.0	19.7
Progression Factor		0.42	1.00		1.00	1.00
Incremental Delay, d2		1.2	0.4		0.1	0.1
Delay (s)		7.1	9.0		20.1	19.7
Level of Service		A	A		C	B
Approach Delay (s)		7.1	9.0		20.0	
Approach LOS		A	A		B	

Intersection Summary			
HCM Average Control Delay	8.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	68.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	60	1230	1290	190	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0			
Lane Util. Factor	1.00	0.95	0.95			
Frpb, ped/bikes	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00	1.00			
Frt	1.00	1.00	0.98			
Flt Protected	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3539	3456			
Flt Permitted	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3539	3456			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	63	1295	1358	200	0	0
RTOR Reduction (vph)	0	0	8	0	0	0
Lane Group Flow (vph)	63	1295	1550	0	0	0
Confl. Peds. (#/hr)				19		
Confl. Bikes (#/hr)				1		
Turn Type	Prot					
Protected Phases	1	6	2			
Permitted Phases						
Actuated Green, G (s)	4.4	50.8	41.4			
Effective Green, g (s)	4.4	50.8	41.4			
Actuated g/C Ratio	0.07	0.76	0.62			
Clearance Time (s)	5.0	5.0	5.0			
Vehicle Extension (s)	3.0	2.0	2.0			
Lane Grp Cap (vph)	116	2675	2129			
v/s Ratio Prot	0.04	c0.37	c0.45			
v/s Ratio Perm						
v/c Ratio	0.54	0.48	0.73			
Uniform Delay, d1	30.4	3.2	9.0			
Progression Factor	1.00	1.00	1.00			
Incremental Delay, d2	5.1	0.1	1.1			
Delay (s)	35.5	3.2	10.1			
Level of Service	D	A	B			
Approach Delay (s)		4.7	10.1		0.0	
Approach LOS		A	B		A	

Intersection Summary			
HCM Average Control Delay	7.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	67.2	Sum of lost time (s)	21.4
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1190	40	80	1410	70	160
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1253	42	84	1484	74	168
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	444			676		
pX, platoon unblocked			0.85		0.82	0.85
vC, conflicting volume			1295		2184	647
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			991		1182	228
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			86		43	74
cM capacity (veh/h)			589		129	657

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	835	460	84	742	742	242
Volume Left	0	0	84	0	0	74
Volume Right	0	42	0	0	0	168
cSH	1700	1700	589	1700	1700	292
Volume to Capacity	0.49	0.27	0.14	0.44	0.44	0.83
Queue Length 95th (ft)	0	0	12	0	0	172
Control Delay (s)	0.0	0.0	12.1	0.0	0.0	56.7
Lane LOS			B			F
Approach Delay (s)	0.0		0.7			56.7
Approach LOS						F

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	270	400	330	1040	20	750	10	380	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.91		1.00	1.00		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3222		1770	3529		1770	1863	1583	1770	1723	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3222		1770	3529		1770	1863	1583	1770	1723	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	284	421	347	1095	21	789	11	400	11	11	11
RTOR Reduction (vph)	0	199	0	0	1	0	0	0	232	0	11	0
Lane Group Flow (vph)	11	506	0	347	1115	0	789	11	168	11	11	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	0.7	25.1		18.1	42.5		46.3	46.3	46.3	4.0	4.0	
Effective Green, g (s)	0.7	25.1		18.1	42.5		46.3	46.3	46.3	4.0	4.0	
Actuated g/C Ratio	0.01	0.23		0.16	0.38		0.42	0.42	0.42	0.04	0.04	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	11	732		290	1357		742	781	663	64	62	
v/s Ratio Prot	0.01	0.16		c0.20	c0.32		c0.45	0.01		0.01	c0.01	
v/s Ratio Perm									0.11			
v/c Ratio	1.00	0.69		1.20	0.82		1.06	0.01	0.25	0.17	0.18	
Uniform Delay, d1	54.9	39.1		46.2	30.6		32.1	18.8	20.9	51.6	51.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	271.4	2.8		117.0	4.1		51.2	0.0	0.2	1.3	1.4	
Delay (s)	326.3	42.0		163.2	34.7		83.3	18.8	21.1	52.9	53.1	
Level of Service	F	D		F	C		F	B	C	D	D	
Approach Delay (s)		46.3			65.2			62.0			53.0	
Approach LOS		D			E			E			D	

Intersection Summary			
HCM Average Control Delay	60.0	HCM Level of Service	E
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	110.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	97.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	290	360	330	530	910	230	160	860	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0		4.0	4.2		4.0	4.2	
Lane Util. Factor					0.95		0.97	0.91		1.00	0.95	
Frt					0.95		1.00	0.97		1.00	0.96	
Flt Protected					0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					3311		3433	4931		1770	3409	
Flt Permitted					0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)					3311		3433	4931		1770	3409	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	296	367	337	541	929	235	163	878	286
RTOR Reduction (vph)	0	0	0	0	0	0	0	34	0	0	19	0
Lane Group Flow (vph)	0	0	0	0	1000	0	541	1130	0	163	1145	0
Turn Type				Split			Prot			Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)					37.0		26.3	68.8		12.0	54.5	
Effective Green, g (s)					37.0		26.3	68.8		12.0	54.5	
Actuated g/C Ratio					0.28		0.20	0.53		0.09	0.42	
Clearance Time (s)					4.0		4.0	4.2		4.0	4.2	
Vehicle Extension (s)					3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)					942		695	2610		163	1429	
v/s Ratio Prot					c0.30		c0.16	0.23		c0.09	c0.34	
v/s Ratio Perm												
v/c Ratio					1.06		0.78	0.43		1.00	0.80	
Uniform Delay, d1					46.5		49.1	18.7		59.0	33.0	
Progression Factor					1.00		0.94	1.24		1.00	1.00	
Incremental Delay, d2					47.1		5.3	0.5		70.5	4.8	
Delay (s)					93.6		51.3	23.6		129.5	37.8	
Level of Service					F		D	C		F	D	
Approach Delay (s)		0.0			93.6			32.4			49.1	
Approach LOS		A			F			C			D	

Intersection Summary			
HCM Average Control Delay	53.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	110	210	0	0	250	0	1100	320	180	1160	450
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0			3.5		3.5	3.5	3.0	3.5	4.0
Lane Util. Factor		0.95	1.00			1.00		0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.99			1.00		1.00	0.99	1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85			0.86		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00			1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3472	1575			1611		3539	1560	3433	3539	1541
Flt Permitted		0.98	1.00			1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3472	1575			1611		3539	1560	3433	3539	1541
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	74	116	221	0	0	263	0	1158	337	189	1221	474
RTOR Reduction (vph)	0	0	31	0	0	23	0	0	74	0	0	0
Lane Group Flow (vph)	0	190	190	0	0	240	0	1158	263	189	1221	474
Confl. Peds. (#/hr)			1			1			1			3
Confl. Bikes (#/hr)			2			2			2			14
Turn Type	Split		custom			custom			custom	Prot		Free
Protected Phases	4!	4	5			2 6 4!		2 11!		1	6 11	
Permitted Phases			4						2			Free
Actuated Green, G (s)		13.0	39.1			99.5		95.0	68.0	12.5	77.9	130.0
Effective Green, g (s)		13.0	39.1			96.5		95.0	68.0	12.5	77.9	130.0
Actuated g/C Ratio		0.10	0.30			0.74		0.73	0.52	0.10	0.60	1.00
Clearance Time (s)		3.0	3.0						3.5	3.0		
Vehicle Extension (s)		3.0	3.0						5.0	3.0		
Lane Grp Cap (vph)		347	474			1196		2586	816	330	2121	1541
v/s Ratio Prot		c0.05	0.08			0.15		c0.33		0.06	c0.34	
v/s Ratio Perm			0.04						0.17			0.31
v/c Ratio		0.55	0.40			0.20		0.45	0.32	0.57	0.58	0.31
Uniform Delay, d1		55.7	36.1			5.1		7.0	17.8	56.2	15.9	0.0
Progression Factor		1.00	1.00			1.00		0.88	1.34	1.08	1.45	1.00
Incremental Delay, d2		1.8	0.6			0.1		0.1	0.9	2.0	0.3	0.4
Delay (s)		57.5	36.7			5.2		6.2	24.8	63.0	23.4	0.4
Level of Service		E	D			A		A	C	E	C	A
Approach Delay (s)		46.3			5.2			10.4			21.6	
Approach LOS		D			A			B			C	

Intersection Summary			
HCM Average Control Delay	18.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	61.6%	ICU Level of Service	B
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	5	40	20	5	70	30	1220	30	30	1230	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1	5.1		5.1		5.1	5.1		5.1	5.1	
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.91	
Frt	1.00	1.00	0.85		0.90		1.00	1.00		1.00	0.99	
Flt Protected	0.95	0.96	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1691	1583		1659		1770	3526		1770	5023	
Flt Permitted	0.95	0.96	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1691	1583		1659		1770	3526		1770	5023	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	137	5	42	21	5	74	32	1284	32	32	1295	116
RTOR Reduction (vph)	0	0	39	0	70	0	0	1	0	0	5	0
Lane Group Flow (vph)	71	71	3	0	30	0	32	1315	0	32	1406	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases			4									
Actuated Green, G (s)	9.6	9.6	9.6		6.7		4.7	88.0		5.3	88.6	
Effective Green, g (s)	9.6	9.6	9.6		6.7		4.7	88.0		5.3	88.6	
Actuated g/C Ratio	0.07	0.07	0.07		0.05		0.04	0.68		0.04	0.68	
Clearance Time (s)	5.1	5.1	5.1		5.1		5.1	5.1		5.1	5.1	
Vehicle Extension (s)	1.7	1.7	1.7		1.7		1.7	2.2		1.7	2.2	
Lane Grp Cap (vph)	124	125	117		86		64	2387		72	3423	
v/s Ratio Prot	c0.04	0.04			c0.02		0.02	c0.37		0.02	c0.28	
v/s Ratio Perm			0.00									
v/c Ratio	0.57	0.57	0.03		0.35		0.50	0.55		0.44	0.41	
Uniform Delay, d1	58.2	58.2	55.9		59.5		61.5	10.8		60.9	9.2	
Progression Factor	1.00	1.00	1.00		1.00		0.89	1.11		0.91	0.78	
Incremental Delay, d2	3.9	3.5	0.0		0.9		1.4	0.6		1.3	0.3	
Delay (s)	62.1	61.7	55.9		60.4		55.9	12.6		57.0	7.4	
Level of Service	E	E	E		E		E	B		E	A	
Approach Delay (s)		60.5			60.4			13.6			8.5	
Approach LOS		E			E			B			A	

Intersection Summary			
HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	370	660	320	110	980	480	180	430	40	220	740	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3321		1770	3539	1559	1770	3490		3433	1863	1562
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3321		1770	3539	1559	1770	3490		3433	1863	1562
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	370	660	320	110	980	480	180	430	40	220	740	330
RTOR Reduction (vph)	0	45	0	0	0	215	0	5	0	0	0	136
Lane Group Flow (vph)	370	935	0	110	980	265	180	465	0	220	740	194
Confl. Peds. (#/hr)			8			2			1			1
Confl. Bikes (#/hr)			2			1						
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	20.9	45.9		9.5	34.5	34.5	10.9	40.7		12.7	42.5	42.5
Effective Green, g (s)	20.9	45.9		9.5	34.5	34.5	10.9	40.7		12.7	42.5	42.5
Actuated g/C Ratio	0.16	0.35		0.07	0.27	0.27	0.08	0.31		0.10	0.33	0.33
Clearance Time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Vehicle Extension (s)	3.0	2.2		3.0	2.2	2.2	3.0	2.2		3.0	2.2	2.2
Lane Grp Cap (vph)	285	1173		129	939	414	148	1093		335	609	511
v/s Ratio Prot	c0.21	0.28		0.06	c0.28		c0.10	0.13		0.06	c0.40	
v/s Ratio Perm						0.17						0.12
v/c Ratio	1.30	0.80		0.85	1.04	0.64	1.22	0.42		0.66	1.22	0.38
Uniform Delay, d1	54.5	37.9		59.6	47.8	42.3	59.5	35.4		56.5	43.8	33.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.07	0.80	0.66
Incremental Delay, d2	157.6	5.7		38.7	41.4	7.4	143.6	0.1		4.3	110.5	0.2
Delay (s)	212.2	43.5		98.3	89.1	49.7	203.2	35.5		64.7	145.6	22.5
Level of Service	F	D		F	F	D	F	D		E	F	C
Approach Delay (s)		89.7			77.7			81.9			100.3	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM Average Control Delay	87.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.7
Intersection Capacity Utilization	114.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	840	20	10	1450	10	60	0	10	10	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.98	
Satd. Flow (prot)	1770	3527		1770	3535			1770	1583		1695	
Flt Permitted	0.95	1.00		0.95	1.00			0.74	1.00		0.83	
Satd. Flow (perm)	1770	3527		1770	3535			1384	1583		1448	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	884	21	11	1526	11	63	0	11	11	0	11
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	10	0	10	0
Lane Group Flow (vph)	11	904	0	11	1537	0	0	63	1	0	12	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		
Actuated Green, G (s)	1.2	68.6		1.2	68.6			7.2	7.2		7.2	
Effective Green, g (s)	1.2	68.6		1.2	68.6			7.2	7.2		7.2	
Actuated g/C Ratio	0.01	0.76		0.01	0.76			0.08	0.08		0.08	
Clearance Time (s)	4.0	5.0		4.0	5.0			4.0	4.0		4.0	
Vehicle Extension (s)	1.5	2.5		1.5	2.5			1.5	1.5		1.5	
Lane Grp Cap (vph)	24	2688		24	2694			111	127		116	
v/s Ratio Prot	c0.01	0.26		0.01	c0.43							
v/s Ratio Perm								c0.05	0.00		0.01	
v/c Ratio	0.46	0.34		0.46	0.57			0.57	0.01		0.10	
Uniform Delay, d1	44.1	3.4		44.1	4.5			39.9	38.1		38.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	5.0	0.3		5.0	0.9			3.9	0.0		0.1	
Delay (s)	49.1	3.8		49.1	5.4			43.8	38.1		38.5	
Level of Service	D	A		D	A			D	D		D	
Approach Delay (s)		4.3			5.7			43.0			38.5	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	6.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	50	60	600	90	120	1150
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	50	60	600	90	120	1150
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2035	645			690	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2035	645			690	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	8	87			87	
cM capacity (veh/h)	54	472			905	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	110	690	1270
Volume Left	50	0	120
Volume Right	60	90	0
cSH	105	1700	905
Volume to Capacity	1.05	0.41	0.13
Queue Length 95th (ft)	169	0	11
Control Delay (s)	177.9	0.0	4.5
Lane LOS	F		A
Approach Delay (s)	177.9	0.0	4.5
Approach LOS	F		

Intersection Summary			
Average Delay	12.2		
Intersection Capacity Utilization	120.7%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	300	440	80	110	1280	190	90	200	40	340	340	520
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	0.98		1.00	0.98			0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	1.00
Satd. Flow (prot)	1770	3458		1770	3471			1808			1817	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.99			0.98	1.00
Satd. Flow (perm)	1770	3458		1770	3471			1808			1817	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	300	440	80	110	1280	190	90	200	40	340	340	520
RTOR Reduction (vph)	0	11	0	0	9	0	0	4	0	0	0	232
Lane Group Flow (vph)	300	509	0	110	1461	0	0	326	0	0	680	288
Turn Type	Prot			Prot			Split			Split		custom
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												6
Actuated Green, G (s)	13.0	39.5		12.6	39.1			25.1			36.0	39.1
Effective Green, g (s)	13.0	39.5		12.6	39.1			25.1			36.0	39.1
Actuated g/C Ratio	0.10	0.31		0.10	0.30			0.19			0.28	0.30
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	178	1057		173	1050			351			506	479
v/s Ratio Prot	c0.17	0.15		0.06	c0.42			c0.18			c0.37	
v/s Ratio Perm												0.18
v/c Ratio	1.69	0.48		0.64	1.39			0.93			1.34	0.60
Uniform Delay, d1	58.1	36.5		56.1	45.0			51.2			46.6	38.4
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	331.6	0.3		7.4	182.0			30.1			167.6	2.1
Delay (s)	389.7	36.9		63.5	227.1			81.2			214.2	40.5
Level of Service	F	D		E	F			F			F	D
Approach Delay (s)		165.9			215.7			81.2			138.9	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	170.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	129.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	126.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1150	0	1780	0	0	0	0	820	350	0	630	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5		3.5					5.0			5.0	4.0
Lane Util. Factor	0.97		1.00					0.91			0.95	1.00
Frt	1.00		0.85					0.96			1.00	0.85
Flt Protected	0.95		1.00					1.00			1.00	1.00
Satd. Flow (prot)	3433		1583					4857			3539	1583
Flt Permitted	0.95		1.00					1.00			1.00	1.00
Satd. Flow (perm)	3433		1583					4857			3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1150	0	1780	0	0	0	0	820	350	0	630	110
RTOR Reduction (vph)	0	0	3	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1150	0	1777	0	0	0	0	1170	0	0	630	110
Turn Type	Prot		custom									Free
Protected Phases	4							2			6	
Permitted Phases			4									Free
Actuated Green, G (s)	96.5		96.5					25.0			25.0	130.0
Effective Green, g (s)	96.5		96.5					25.0			25.0	130.0
Actuated g/C Ratio	0.74		0.74					0.19			0.19	1.00
Clearance Time (s)	3.5		3.5					5.0			5.0	
Vehicle Extension (s)	4.0		4.0					4.0			4.0	
Lane Grp Cap (vph)	2548		1175					934			681	1583
v/s Ratio Prot	0.33							c0.24			0.18	
v/s Ratio Perm			c1.12									0.07
v/c Ratio	0.45		1.51					1.25			0.93	0.07
Uniform Delay, d1	6.5		16.8					52.5			51.6	0.0
Progression Factor	1.00		1.00					1.00			1.00	1.00
Incremental Delay, d2	0.2		235.0					122.6			18.7	0.1
Delay (s)	6.7		251.7					175.1			70.2	0.1
Level of Service	A		F					F			E	A
Approach Delay (s)		155.5			0.0			175.1			59.8	
Approach LOS		F			A			F			E	

Intersection Summary			
HCM Average Control Delay	145.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.46		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	135.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	220	240	30	320	440	390	150	500	220	940	870	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	6.0		5.5	6.0	6.0	5.5	7.0		5.5	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	0.97	0.95		0.97	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.95		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3480		1770	3539	1583	3433	3377		3433	3393	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3480		1770	3539	1583	3433	3377		3433	3393	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	232	253	32	337	463	411	158	526	232	989	916	347
RTOR Reduction (vph)	0	8	0	0	0	335	0	36	0	0	27	0
Lane Group Flow (vph)	232	277	0	337	463	76	158	722	0	989	1236	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	20.2	20.3		24.5	24.6	24.6	8.0	27.0		36.6	55.6	
Effective Green, g (s)	20.2	20.3		24.5	24.6	24.6	8.0	27.0		36.6	55.6	
Actuated g/C Ratio	0.15	0.15		0.19	0.19	0.19	0.06	0.20		0.28	0.42	
Clearance Time (s)	5.5	6.0		5.5	6.0	6.0	5.5	7.0		5.5	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	4.5		3.0	4.5	
Lane Grp Cap (vph)	270	534		328	658	294	207	689		949	1425	
v/s Ratio Prot	0.13	0.08		c0.19	c0.13		0.05	c0.21		c0.29	0.36	
v/s Ratio Perm						0.05						
v/c Ratio	0.86	0.52		1.03	0.70	0.26	0.76	1.05		1.04	0.87	
Uniform Delay, d1	54.7	51.6		54.0	50.5	46.1	61.3	52.7		47.9	35.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	22.8	0.9		56.9	3.4	0.5	15.3	47.6		40.8	6.2	
Delay (s)	77.5	52.4		110.9	53.9	46.6	76.6	100.3		88.7	41.2	
Level of Service	E	D		F	D	D	E	F		F	D	
Approach Delay (s)		63.7			67.3			96.2			62.1	
Approach LOS		E			E			F			E	

Intersection Summary			
HCM Average Control Delay	69.9	HCM Level of Service	E
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	132.4	Sum of lost time (s)	24.0
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	1470	170	140	1140	100	100	0	80	60	0	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	5.0	6.0		5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00		1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00		0.85	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3497		1770		1583	1770	1583	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3497		1770		1583	1770	1583	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	1547	179	147	1200	105	105	0	84	63	0	74
RTOR Reduction (vph)	0	0	78	0	4	0	0	0	78	0	69	0
Lane Group Flow (vph)	126	1547	101	147	1301	0	105	0	6	63	5	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2						4			
Actuated Green, G (s)	9.0	49.2	49.2	10.0	50.2		7.0		7.0	6.7	6.7	
Effective Green, g (s)	9.0	49.2	49.2	10.0	50.2		7.0		7.0	6.7	6.7	
Actuated g/C Ratio	0.10	0.52	0.52	0.11	0.53		0.07		0.07	0.07	0.07	
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0		5.0		5.0	5.0	5.0	
Vehicle Extension (s)	3.0	2.0	2.0	3.0	2.0		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	170	1854	829	188	1870		132		118	126	113	
v/s Ratio Prot	0.07	c0.44		c0.08	0.37		c0.06			0.04	0.00	
v/s Ratio Perm			0.06						c0.00			
v/c Ratio	0.74	0.83	0.12	0.78	0.70		0.80		0.05	0.50	0.05	
Uniform Delay, d1	41.3	18.9	11.4	40.9	16.2		42.7		40.4	42.0	40.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2	15.9	3.3	0.0	18.8	0.9		27.3		0.2	3.1	0.2	
Delay (s)	57.2	22.2	11.4	59.7	17.1		70.0		40.6	45.1	40.8	
Level of Service	E	C	B	E	B		E		D	D	D	
Approach Delay (s)		23.5			21.4			56.9			42.8	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM Average Control Delay	25.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	93.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1490	120	50	1320	60	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		5.0	6.0	5.0	5.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3500		1770	3539	1770	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3500		1770	3539	1770	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1568	126	53	1389	63	32
RTOR Reduction (vph)	6	0	0	0	0	29
Lane Group Flow (vph)	1688	0	53	1389	63	3
Turn Type			Prot			Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	33.7		4.5	43.2	4.7	4.7
Effective Green, g (s)	33.7		4.5	43.2	4.7	4.7
Actuated g/C Ratio	0.57		0.08	0.73	0.08	0.08
Clearance Time (s)	6.0		5.0	6.0	5.0	5.0
Vehicle Extension (s)	4.0		3.0	4.0	3.0	3.0
Lane Grp Cap (vph)	2003		135	2596	141	126
v/s Ratio Prot	c0.48		0.03	c0.39	c0.04	
v/s Ratio Perm						0.00
v/c Ratio	0.84		0.39	0.54	0.45	0.02
Uniform Delay, d1	10.4		25.9	3.4	25.9	25.0
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	3.6		1.9	0.3	2.2	0.1
Delay (s)	14.0		27.8	3.7	28.1	25.0
Level of Service	B		C	A	C	C
Approach Delay (s)	14.0			4.6	27.1	
Approach LOS	B			A	C	

Intersection Summary			
HCM Average Control Delay	10.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	58.9	Sum of lost time (s)	17.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1400	120	120	1310	60	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	0.99		1.00	1.00	0.92	
Flt Protected	1.00		0.95	1.00	0.98	
Satd. Flow (prot)	3497		1770	3539	1678	
Flt Permitted	1.00		0.95	1.00	0.98	
Satd. Flow (perm)	3497		1770	3539	1678	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1474	126	126	1379	63	95
RTOR Reduction (vph)	6	0	0	0	54	0
Lane Group Flow (vph)	1594	0	126	1379	104	0
Turn Type			Prot			
Protected Phases	2		1		7	
Permitted Phases				6		
Actuated Green, G (s)	49.0		8.0	62.0	27.8	
Effective Green, g (s)	49.0		8.0	62.0	27.8	
Actuated g/C Ratio	0.49		0.08	0.62	0.28	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Vehicle Extension (s)	2.0		3.0	2.0	3.0	
Lane Grp Cap (vph)	1717		142	2199	467	
v/s Ratio Prot	c0.46		c0.07		c0.06	
v/s Ratio Perm				0.39		
v/c Ratio	0.93		0.89	0.63	0.22	
Uniform Delay, d1	23.8		45.5	11.7	27.7	
Progression Factor	1.00		1.39	0.17	1.00	
Incremental Delay, d2	9.1		36.7	0.3	0.2	
Delay (s)	32.8		99.9	2.4	27.9	
Level of Service	C		F	A	C	
Approach Delay (s)	32.8			10.5	27.9	
Approach LOS	C			B	C	

Intersection Summary			
HCM Average Control Delay	22.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	99.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱
Volume (vph)	0	1490	1350	0	450	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0	5.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frpb, ped/bikes		1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	3539		1770	1583
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	3539		1770	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1568	1421	0	474	84
RTOR Reduction (vph)	0	0	0	0	0	36
Lane Group Flow (vph)	0	1568	1421	0	474	48
Confl. Peds. (#/hr)					20	
Turn Type						Perm
Protected Phases		2	6		3	
Permitted Phases						3
Actuated Green, G (s)		49.0	62.0		27.8	27.8
Effective Green, g (s)		49.0	62.0		27.8	27.8
Actuated g/C Ratio		0.49	0.62		0.28	0.28
Clearance Time (s)		5.0	5.0		5.0	5.0
Vehicle Extension (s)		2.0	2.0		3.0	3.0
Lane Grp Cap (vph)		1738	2199		493	441
v/s Ratio Prot		c0.44	c0.40		c0.27	
v/s Ratio Perm						0.03
v/c Ratio		0.90	0.65		0.96	0.11
Uniform Delay, d1		23.2	12.0		35.5	26.8
Progression Factor		0.21	1.00		1.00	1.00
Incremental Delay, d2		3.1	0.5		30.7	0.1
Delay (s)		8.1	12.5		66.2	26.9
Level of Service		A	B		E	C
Approach Delay (s)		8.1	12.5		60.3	
Approach LOS		A	B		E	

Intersection Summary			
HCM Average Control Delay	18.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	99.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	40	1900	1350	100	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0			
Lane Util. Factor	1.00	0.95	0.95			
Frpb, ped/bikes	1.00	1.00	1.00			
Flpb, ped/bikes	1.00	1.00	1.00			
Frt	1.00	1.00	0.99			
Flt Protected	0.95	1.00	1.00			
Satd. Flow (prot)	1770	3539	3498			
Flt Permitted	0.95	1.00	1.00			
Satd. Flow (perm)	1770	3539	3498			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	2000	1421	105	0	0
RTOR Reduction (vph)	0	0	3	0	0	0
Lane Group Flow (vph)	42	2000	1523	0	0	0
Confl. Peds. (#/hr)				5		
Confl. Bikes (#/hr)				2		
Turn Type	Prot					
Protected Phases	1	6	2			
Permitted Phases						
Actuated Green, G (s)	3.1	58.8	50.7			
Effective Green, g (s)	3.1	58.8	50.7			
Actuated g/C Ratio	0.04	0.82	0.70			
Clearance Time (s)	5.0	5.0	5.0			
Vehicle Extension (s)	3.0	2.0	2.0			
Lane Grp Cap (vph)	76	2890	2463			
v/s Ratio Prot	0.02	c0.57	0.44			
v/s Ratio Perm						
v/c Ratio	0.55	0.69	0.62			
Uniform Delay, d1	33.8	2.8	5.6			
Progression Factor	1.00	1.00	1.00			
Incremental Delay, d2	8.4	0.6	0.3			
Delay (s)	42.2	3.4	5.9			
Level of Service	D	A	A			
Approach Delay (s)		4.2	5.9		0.0	
Approach LOS		A	A		A	

Intersection Summary			
HCM Average Control Delay	4.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	13.2
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1830	70	160	1410	40	120
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1926	74	168	1484	42	126
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	444			676		
pX, platoon unblocked			0.23		0.32	0.23
vC, conflicting volume			2000		3042	1000
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		578	0
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			54		45	49
cM capacity (veh/h)			369		77	247

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	1284	716	168	742	742	168
Volume Left	0	0	168	0	0	42
Volume Right	0	74	0	0	0	126
cSH	1700	1700	369	1700	1700	159
Volume to Capacity	0.76	0.42	0.46	0.44	0.44	1.06
Queue Length 95th (ft)	0	0	58	0	0	213
Control Delay (s)	0.0	0.0	22.7	0.0	0.0	144.7
Lane LOS			C			F
Approach Delay (s)	0.0		2.3			144.7
Approach LOS						F

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	600	340	300	400	20	440	30	310	30	20	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.99		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3347		1770	3514		1770	1863	1583	1770	1723	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3347		1770	3514		1770	1863	1583	1770	1723	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	21	625	354	312	417	21	458	31	323	31	21	21
RTOR Reduction (vph)	0	56	0	0	3	0	0	0	230	0	20	0
Lane Group Flow (vph)	21	923	0	312	435	0	458	31	93	31	22	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.9	36.5		22.0	56.6		33.1	33.1	33.1	6.3	6.3	
Effective Green, g (s)	1.9	36.5		22.0	56.6		33.1	33.1	33.1	6.3	6.3	
Actuated g/C Ratio	0.02	0.32		0.19	0.49		0.29	0.29	0.29	0.05	0.05	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	29	1063		339	1731		510	537	456	97	94	
v/s Ratio Prot	0.01	c0.28		c0.18	0.12		c0.26	0.02		c0.02	0.01	
v/s Ratio Perm									0.06			
v/c Ratio	0.72	0.87		0.92	0.25		0.90	0.06	0.20	0.32	0.24	
Uniform Delay, d1	56.2	36.9		45.6	16.9		39.3	29.6	30.9	52.2	52.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	61.8	7.7		29.4	0.1		18.3	0.0	0.2	1.9	1.3	
Delay (s)	118.0	44.6		75.0	17.0		57.6	29.7	31.2	54.1	53.3	
Level of Service	F	D		E	B		E	C	C	D	D	
Approach Delay (s)		46.2			41.1			46.0			53.7	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	44.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	114.9	Sum of lost time (s)	17.0
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	230	170	80	290	1240	870	180	810	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0		4.0	4.2		4.0	4.2	
Lane Util. Factor					0.95		0.97	0.91		1.00	0.95	
Frt					0.98		1.00	0.94		1.00	0.97	
Flt Protected					0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					3370		3433	4771		1770	3438	
Flt Permitted					0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)					3370		3433	4771		1770	3438	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	240	177	83	302	1292	906	188	844	198
RTOR Reduction (vph)	0	0	0	0	0	0	0	95	0	0	9	0
Lane Group Flow (vph)	0	0	0	0	500	0	302	2103	0	188	1033	0
Turn Type				Split			Prot			Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)					24.9		16.9	70.4		22.5	76.0	
Effective Green, g (s)					24.9		16.9	70.4		22.5	76.0	
Actuated g/C Ratio					0.19		0.13	0.54		0.17	0.58	
Clearance Time (s)					4.0		4.0	4.2		4.0	4.2	
Vehicle Extension (s)					3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)					645		446	2584		306	2010	
v/s Ratio Prot					c0.15		c0.09	c0.44		c0.11	0.30	
v/s Ratio Perm												
v/c Ratio					0.78		0.68	0.95dr		0.61	0.51	
Uniform Delay, d1					49.9		53.9	24.4		49.7	16.0	
Progression Factor					1.00		0.99	0.87		1.00	1.00	
Incremental Delay, d2					5.8		3.4	2.5		3.6	0.9	
Delay (s)					55.7		56.9	23.7		53.4	17.0	
Level of Service					E		E	C		D	B	
Approach Delay (s)		0.0			55.7			27.7			22.5	
Approach LOS		A			E			C			C	

Intersection Summary			
HCM Average Control Delay	29.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	190	690	0	0	950	0	1050	380	190	1100	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0			3.5		3.5	3.5	3.0	3.5	4.0
Lane Util. Factor		0.95	1.00			1.00		0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.99			1.00		1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85			0.86		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00			1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3472	1574			1611		3539	1554	3433	3539	1535
Flt Permitted		0.98	1.00			1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3472	1574			1611		3539	1554	3433	3539	1535
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	125	198	719	0	0	990	0	1094	396	198	1146	250
RTOR Reduction (vph)	0	0	32	0	0	27	0	0	109	0	0	0
Lane Group Flow (vph)	0	323	687	0	0	963	0	1094	287	198	1146	250
Confl. Peds. (#/hr)						2			2			11
Confl. Bikes (#/hr)			1			5			5			14
Turn Type	Split		custom			custom			custom	Prot		Free
Protected Phases	4!	4	5			2 6 4!		2 11!		1	6 11	
Permitted Phases			4						2			Free
Actuated Green, G (s)		24.0	50.0			99.5		83.8	56.8	12.7	67.0	130.0
Effective Green, g (s)		24.0	50.0			96.5		83.8	56.8	12.7	67.0	130.0
Actuated g/C Ratio		0.18	0.38			0.74		0.64	0.44	0.10	0.52	1.00
Clearance Time (s)		3.0	3.0						3.5	3.0		
Vehicle Extension (s)		3.0	3.0						5.0	3.0		
Lane Grp Cap (vph)		641	605			1196		2281	679	335	1824	1535
v/s Ratio Prot		0.09	c0.23			c0.60		0.31		0.06	c0.32	
v/s Ratio Perm			0.21						0.18			0.16
v/c Ratio		0.50	1.14			0.81		0.48	0.42	0.59	0.63	0.16
Uniform Delay, d1		47.6	40.0			10.7		11.9	25.3	56.2	22.6	0.0
Progression Factor		1.00	1.00			1.00		1.04	1.68	1.11	0.67	1.00
Incremental Delay, d2		0.6	80.0			4.0		0.1	1.7	2.7	0.7	0.2
Delay (s)		48.3	120.0			14.8		12.5	44.0	64.9	15.7	0.2
Level of Service		D	F			B		B	D	E	B	A
Approach Delay (s)		97.8			14.8			20.8			19.4	
Approach LOS		F			B			C			B	

Intersection Summary			
HCM Average Control Delay	34.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	106.8%	ICU Level of Service	G
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #12 Bailey Rd./Maylard St.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.543
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	50	Level Of Service:	A

Street Name:	Bailey Rd.						Maylard St.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1	1 0	1 0	2	1 0	1 1	0	0 1	0 0	1!	0 0
Volume Module:												
Base Vol:	30	1220	30	30	1230	110	130	5	40	20	5	70
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	30	1220	30	30	1230	110	130	5	40	20	5	70
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	30	1220	30	30	1230	110	130	5	40	20	5	70
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	33	1326	33	33	1337	120	141	5	43	22	5	76
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	33	1326	33	33	1337	120	141	5	43	22	5	76
RTOR Reduct:	0	0	0	0	0	0	0	0	33	0	0	0
RTOR Vol:	33	1326	33	33	1337	120	141	5	11	22	5	76
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	33	1326	33	33	1337	120	141	5	11	22	5	76
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.95	0.05	1.00	2.75	0.25	1.93	0.07	1.00	0.21	0.05	0.74
Final Sat.:	1650	3221	79	1650	4544	406	2889	122	1650	347	87	1216
Capacity Analysis Module:												
Vol/Sat:	0.02	0.41	0.41	0.02	0.29	0.29	0.05	0.04	0.01	0.06	0.06	0.06
Crit Volume:			679	33			73				103	
Crit Moves:			****	****			****				****	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	280	5	140	10	5	50	60	1100	20	80	1530	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1	5.1		5.1		5.1	5.1		5.1	5.1	
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.91	
Frt	1.00	1.00	0.85		0.90		1.00	1.00		1.00	0.98	
Flt Protected	0.95	0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1688	1583		1656		1770	3530		1770	5005	
Flt Permitted	0.95	0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1688	1583		1656		1770	3530		1770	5005	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	295	5	147	11	5	53	63	1158	21	84	1611	189
RTOR Reduction (vph)	0	0	128	0	51	0	0	1	0	0	8	0
Lane Group Flow (vph)	150	150	19	0	18	0	63	1178	0	84	1792	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases			4									
Actuated Green, G (s)	16.7	16.7	16.7		5.3		7.5	77.7		9.9	80.1	
Effective Green, g (s)	16.7	16.7	16.7		5.3		7.5	77.7		9.9	80.1	
Actuated g/C Ratio	0.13	0.13	0.13		0.04		0.06	0.60		0.08	0.62	
Clearance Time (s)	5.1	5.1	5.1		5.1		5.1	5.1		5.1	5.1	
Vehicle Extension (s)	1.7	1.7	1.7		1.7		1.7	2.2		1.7	2.2	
Lane Grp Cap (vph)	216	217	203		68		102	2110		135	3084	
v/s Ratio Prot	c0.09	0.09			c0.01		0.04	c0.33		0.05	c0.36	
v/s Ratio Perm			0.01									
v/c Ratio	0.69	0.69	0.09		0.27		0.62	0.56		0.62	0.58	
Uniform Delay, d1	54.2	54.2	50.0		60.5		59.8	15.8		58.2	14.9	
Progression Factor	1.00	1.00	1.00		1.00		0.79	1.31		0.94	0.87	
Incremental Delay, d2	7.6	7.4	0.1		0.8		4.8	0.7		3.5	0.4	
Delay (s)	61.8	61.6	50.0		61.2		51.8	21.4		58.3	13.4	
Level of Service	E	E	D		E		D	C		E	B	
Approach Delay (s)		57.9			61.2			23.0			15.4	
Approach LOS		E			E			C			B	

Intersection Summary			
HCM Average Control Delay	24.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.4
Intersection Capacity Utilization	65.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	380	1390	180	60	720	470	320	330	100	800	350	530
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3465		1770	3539	1557	1770	3403		3433	1863	1562
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3465		1770	3539	1557	1770	3403		3433	1863	1562
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	380	1390	180	60	720	470	320	330	100	800	350	530
RTOR Reduction (vph)	0	8	0	0	0	289	0	22	0	0	0	290
Lane Group Flow (vph)	380	1562	0	60	720	181	320	408	0	800	350	240
Confl. Peds. (#/hr)			6			1			3			1
Confl. Bikes (#/hr)						3						
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	27.8	50.5		5.0	27.7	27.7	24.5	25.0		28.3	28.8	28.8
Effective Green, g (s)	27.8	50.5		5.0	27.7	27.7	24.5	25.0		28.3	28.8	28.8
Actuated g/C Ratio	0.21	0.39		0.04	0.21	0.21	0.19	0.19		0.22	0.22	0.22
Clearance Time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Vehicle Extension (s)	3.0	2.2		3.0	2.2	2.2	3.0	2.2		3.0	2.2	2.2
Lane Grp Cap (vph)	379	1346		68	754	332	334	654		747	413	346
v/s Ratio Prot	c0.21	c0.45		0.03	0.20		0.18	0.12		c0.23	c0.19	
v/s Ratio Perm						0.12						0.15
v/c Ratio	1.00	1.16		0.88	0.95	0.55	0.96	0.62		1.07	0.85	0.69
Uniform Delay, d1	51.1	39.8		62.2	50.5	45.5	52.2	48.2		50.9	48.5	46.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		0.99	0.79	1.00
Incremental Delay, d2	46.9	80.9		69.4	22.1	1.2	37.8	1.5		51.2	16.5	9.4
Delay (s)	98.0	120.6		131.6	72.6	46.7	90.0	49.6		101.6	55.0	56.0
Level of Service	F	F		F	E	D	F	D		F	D	E
Approach Delay (s)		116.2			65.7			66.9			77.5	
Approach LOS		F			E			E			E	

Intersection Summary			
HCM Average Control Delay	86.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	21.2
Intersection Capacity Utilization	104.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	2140	40	10	1150	10	20	0	10	10	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.98	
Satd. Flow (prot)	1770	3530		1770	3534			1770	1583		1695	
Flt Permitted	0.95	1.00		0.95	1.00			0.98	1.00		0.83	
Satd. Flow (perm)	1770	3530		1770	3534			1817	1583		1444	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	2253	42	11	1211	11	21	0	11	11	0	11
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	11	0	11	0
Lane Group Flow (vph)	11	2295	0	11	1222	0	0	21	0	0	11	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		
Actuated Green, G (s)	1.2	91.7		1.2	91.7			4.1	4.1		4.1	
Effective Green, g (s)	1.2	91.7		1.2	91.7			4.1	4.1		4.1	
Actuated g/C Ratio	0.01	0.83		0.01	0.83			0.04	0.04		0.04	
Clearance Time (s)	4.0	5.0		4.0	5.0			4.0	4.0		4.0	
Vehicle Extension (s)	1.5	2.5		1.5	2.5			1.5	1.5		1.5	
Lane Grp Cap (vph)	19	2943		19	2946			68	59		54	
v/s Ratio Prot	c0.01	c0.65		0.01	0.35							
v/s Ratio Perm								c0.01	0.00		0.01	
v/c Ratio	0.58	0.78		0.58	0.41			0.31	0.01		0.21	
Uniform Delay, d1	54.1	4.3		54.1	2.3			51.6	51.0		51.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	23.8	2.1		23.8	0.4			0.9	0.0		0.7	
Delay (s)	78.0	6.5		78.0	2.8			52.5	51.0		52.1	
Level of Service	E	A		E	A			D	D		D	
Approach Delay (s)		6.8			3.4			52.0			52.1	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	6.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	20	70	800	50	50	510
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	74	842	53	53	537
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1511	868			895	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1511	868			895	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	83	79			93	
cM capacity (veh/h)	123	352			758	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	95	895	589
Volume Left	21	0	53
Volume Right	74	53	0
cSH	249	1700	758
Volume to Capacity	0.38	0.53	0.07
Queue Length 95th (ft)	42	0	6
Control Delay (s)	28.1	0.0	1.8
Lane LOS	D		A
Approach Delay (s)	28.1	0.0	1.8
Approach LOS	D		

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	1050	120	50	500	240	100	360	80	130	280	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	0.98		1.00	0.95			0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	1.00
Satd. Flow (prot)	1770	3485		1770	3367			1809			1834	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.99			0.98	1.00
Satd. Flow (perm)	1770	3485		1770	3367			1809			1834	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	250	1050	120	50	500	240	100	360	80	130	280	120
RTOR Reduction (vph)	0	7	0	0	45	0	0	5	0	0	0	89
Lane Group Flow (vph)	250	1163	0	50	695	0	0	535	0	0	410	31
Turn Type	Prot			Prot			Split			Split		custom
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												6
Actuated Green, G (s)	18.0	44.0		4.0	30.0			37.0			29.0	30.0
Effective Green, g (s)	18.0	44.0		4.0	30.0			37.0			29.0	30.0
Actuated g/C Ratio	0.14	0.34		0.03	0.23			0.28			0.22	0.23
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	245	1180		54	777			515			409	365
v/s Ratio Prot	c0.14	c0.33		0.03	0.21			c0.30			c0.22	
v/s Ratio Perm												0.02
v/c Ratio	1.02	0.99		0.93	0.89			1.04			1.00	0.08
Uniform Delay, d1	56.0	42.7		62.9	48.5			46.5			50.5	39.2
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	62.9	22.6		94.6	12.8			50.1			45.1	0.1
Delay (s)	118.9	65.3		157.5	61.3			96.6			95.6	39.3
Level of Service	F	E		F	E			F			F	D
Approach Delay (s)		74.7			67.4			96.6			82.9	
Approach LOS		E			E			F			F	

Intersection Summary			
HCM Average Control Delay	77.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #1 Willow Pass Rd./SR 4 EB Ramps

Cycle (sec):	180	Critical Vol./Cap.(X):	0.764
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	97	Level Of Service:	C

Street Name:	Willow Pass Rd.						SR 4 EB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Ignore			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0 0 2 1 0			0 0 2 0 1			2 0 0 0 1			0 0 0 0 0		
Volume Module:												
Base Vol:	0	1990	280	0	470	280	380	0	400	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1990	280	0	470	280	380	0	400	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1990	280	0	470	280	380	0	400	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
PHF Volume:	0	2261	318	0	534	318	432	0	455	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	2261	318	0	534	318	432	0	455	0	0	0
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Vol:	0	2261	318	0	534	318	432	0	455	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	2261	318	0	534	318	432	0	455	0	0	0
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	2.63	0.37	0.00	2.00	1.00	2.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	0	4524	636	0	3440	1720	3127	0	1720	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.50	0.50	0.00	0.16	0.18	0.14	0.00	0.26	0.00	0.00	0.00
Crit Volume:			860	0					455		0	
Crit Moves:			****	****					****			

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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #2 San Marco Blvd./W Leland Rd.
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):        1.000
Loss Time (sec):       0                Average Delay (sec/veh):     xxxxxx
Optimal Cycle:       180                Level Of Service:                 E
********************************************************************************
Street Name:         San Marco Blvd.                     W Leland Rd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        2  0  1  1  0    2  0  1  1  0    1  0  1  1  0    1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      60  910   350   300  510    50   210  340   140   330  110  1050
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   60  910   350   300  510    50   210  340   140   330  110  1050
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
RTOR Adjust:    0    0     0     0    0     0     0    0     0     0    0  -323
Initial Fut:   60  910   350   300  510    50   210  340   140   330  110   727
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:    63  958   368   316  537    53   221  358   147   347  116   765
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   63  958   368   316  537    53   221  358   147   347  116   765
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0   174
RTOR Vol:      63  958   368   316  537    53   221  358   147   347  116   592
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   63  958   368   316  537    53   221  358   147   347  116   592
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  0.91 1.00  1.00  0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       2.00 1.44  0.56  2.00 1.82  0.18  1.00 1.42  0.58  1.00 2.00  1.00
Final Sat.:  3000 2383   917  3000 3005   295  1650 2338   962  1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.40  0.40  0.11 0.18  0.18  0.13 0.15  0.15  0.21 0.04  0.36
Crit Volume:       663         158               221                         592
Crit Moves:       ****        ****              ****                        ****
********************************************************************************
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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Alves Ranch Rd./W Leland Rd.
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):        0.715
Loss Time (sec):        0                Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         80                Level Of Service:                 C
********************************************************************************
Street Name:          Alves Ranch Rd.                     W Leland Rd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        1  0  1  0  1    1  0  0  1  0    1  0  2  0  1    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     200    0   210   100    0   120    40  860   190   120 1520     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  200    0   210   100    0   120    40  860   190   120 1520     0
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  200    0   210   100    0   120    40  860   190   120 1520     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:   211    0   221   105    0   126    42  905   200   126 1600     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  211    0   221   105    0   126    42  905   200   126 1600     0
RTOR Reduct:    0    0   126     0    0     0     0    0   200     0    0     0
RTOR Vol:     211    0    95   105    0   126    42  905     0   126 1600     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  211    0    95   105    0   126    42  905     0   126 1600     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.00  1.00  1.00 0.00  1.00  1.00 2.00  1.00  1.00 2.00  0.00
Final Sat.:  1650 1650  1650  1650    0  1650  1650 3300  1650  1650 3300     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.13 0.00  0.06  0.06 0.00  0.08  0.03 0.27  0.00  0.08 0.48  0.00
Crit Volume:  211                           126    42                    800
Crit Moves:  ****                          ****  ****                   ****
********************************************************************************
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Level Of Service Computation Report

CCTALOS Method (Future Volume Alternative)

Intersection #4 Woodhill Dr./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.661
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	67	Level Of Service:	B

Street Name:	Woodhill Dr.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	0	0 1	0 0	0	0 0	0 0	1	1 0	1 0	2	0 0
Volume Module:												
Base Vol:	180	0	60	0	0	0	0	1100	70	30	1460	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	180	0	60	0	0	0	0	1100	70	30	1460	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	180	0	60	0	0	0	0	1100	70	30	1460	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
PHF Volume:	225	0	75	0	0	0	0	1375	88	38	1825	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	225	0	75	0	0	0	0	1375	88	38	1825	0
RTOR Reduct:	0	0	38	0	0	0	0	0	0	0	0	0
RTOR Vol:	225	0	38	0	0	0	0	1375	88	38	1825	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	225	0	38	0	0	0	0	1375	88	38	1825	0
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.88	0.12	1.00	2.00	0.00
Final Sat.:	1720	0	1720	0	0	0	0	3234	206	1720	3440	0
Capacity Analysis Module:												
Vol/Sat:	0.13	0.00	0.02	0.00	0.00	0.00	0.00	0.43	0.43	0.02	0.53	0.00
Crit Volume:	225				0		0				913	
Crit Moves:	****						****				****	

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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #5 Southwood Dr./W Leland Rd.
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):        0.703
Loss Time (sec):       0               Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        63               Level Of Service:                 C
********************************************************************************
Street Name:              Southwood Dr.                     W Leland Rd.
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Protected        Protected
Rights:            Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  1! 0  0   0  0  0  0  0   0  0  1  1  0   1  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     190    0   140    0    0     0    0 1100    60   30 1300     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  190    0   140    0    0     0    0 1100    60   30 1300     0
Added Vol:      0    0     0    0    0     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  190    0   140    0    0     0    0 1100    60   30 1300     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.81 0.81  0.81 0.81 0.81  0.81 0.81 0.81  0.81 0.81 0.81  0.81
PHF Volume:   235    0   173    0    0     0    0 1358    74   37 1605     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  235    0   173    0    0     0    0 1358    74   37 1605     0
RTOR Reduct:    0    0     0    0    0     0    0    0     0    0    0     0
RTOR Vol:     235    0   173    0    0     0    0 1358    74   37 1605     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  235    0   173    0    0     0    0 1358    74   37 1605     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.58 0.00  0.42 0.00 0.00  0.00 0.00 1.90  0.10 1.00 2.00  0.00
Final Sat.:   990    0   730    0    0     0    0 3262   178 1720 3440     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.24 0.00  0.24 0.00 0.00  0.00 0.00 0.42  0.42 0.02 0.47  0.00
Crit Volume:             407    0               0                     802
Crit Moves:             ****               ****                      ****
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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #6 West Bart Driveway/W Leland Rd.
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):        0.493
Loss Time (sec):        0                Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         37                Level Of Service:                 A
********************************************************************************
Street Name:        West Bart Driveway                   W Leland Rd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  0  0  0   1  0  0  0  1   0  0  2  0  0   0  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0     0   50    0    40     0 1240     0     0 1290     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0    0     0   50    0    40     0 1240     0     0 1290     0
Added Vol:      0    0     0    0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0    0    0     0     0    0     0     0    0     0
Initial Fut:    0    0     0   50    0    40     0 1240     0     0 1290     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.82 0.82  0.82 0.82 0.82  0.82  0.82 0.82  0.82  0.82 0.82  0.82
PHF Volume:     0    0     0   61    0    49     0 1512     0     0 1573     0
Reduct Vol:     0    0     0    0    0     0     0    0     0     0    0     0
Reduced Vol:    0    0     0   61    0    49     0 1512     0     0 1573     0
RTOR Reduct:    0    0     0    0    0     0     0    0     0     0    0     0
RTOR Vol:       0    0     0   61    0    49     0 1512     0     0 1573     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0    0     0   61    0    49     0 1512     0     0 1573     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 0.00  0.00 1.00 0.00  1.00  0.00 2.00  0.00  0.00 2.00  0.00
Final Sat.:     0    0     0 1720    0  1720     0 3440     0     0 3440     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.04 0.00  0.03  0.00 0.44  0.00  0.00 0.46  0.00
Crit Volume:         0          61                 0                      787
Crit Moves:                   ****              ****                     ****
********************************************************************************
```

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #7 East Bart Driveway/W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.523
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	48	Level Of Service:	A

Street Name:	East Bart Driveway						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0 0	0	0 0	0 0	0	0 0	1 0	2	0 0	0 0	1	1 0
Volume Module:												
Base Vol:	0	0	0	0	0	0	60	1230	0	0	1290	190
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	0	0	0	60	1230	0	0	1290	190
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	0	0	0	60	1230	0	0	1290	190
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
PHF Volume:	0	0	0	0	0	0	71	1447	0	0	1518	224
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	0	0	0	71	1447	0	0	1518	224
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Vol:	0	0	0	0	0	0	71	1447	0	0	1518	224
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	0	0	0	71	1447	0	0	1518	224
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	0.00	0.00	0.00	1.00	2.00	0.00	0.00	1.74	0.26
Final Sat.:	0	0	0	0	0	0	1800	3600	0	0	3138	462
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.40	0.00	0.00	0.48	0.48
Crit Volume:		0			0		71				871	
Crit Moves:							****				****	

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #9 Bailey Rd./Willow Pass Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.957
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	180	Level Of Service:	E

Street Name:	Bailey Rd.						Willow Pass Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1 0	1	1 0	0 1	0	1 0	1 1	0	1 0	1 1	0
Volume Module:												
Base Vol:	750	10	380	10	10	10	10	270	400	330	1040	20
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	750	10	380	10	10	10	10	270	400	330	1040	20
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	750	10	380	10	10	10	10	270	400	330	1040	20
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	789	11	400	11	11	11	11	284	421	347	1095	21
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	789	11	400	11	11	11	11	284	421	347	1095	21
RTOR Reduct:	0	0	347	0	0	0	0	0	0	0	0	0
RTOR Vol:	789	11	53	11	11	11	11	284	421	347	1095	21
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	789	11	53	11	11	11	11	284	421	347	1095	21
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.00	1.00	1.00	0.50	0.50	1.00	1.00	1.00	1.00	1.96	0.04
Final Sat.:	1650	1650	1650	1650	825	825	1650	1650	1650	1650	3238	62
Capacity Analysis Module:												
Vol/Sat:	0.48	0.01	0.03	0.01	0.01	0.01	0.01	0.17	0.26	0.21	0.34	0.34
Crit Volume:	789				21				421	347		
Crit Moves:	****				****				****	****		

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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #10 Bailey Rd./SR 4 WB Ramps-Canal Rd.
********************************************************************************
Cycle (sec):          100                 Critical Vol./Cap.(X):         0.802
Loss Time (sec):        0                 Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        115                 Level Of Service:                  D
********************************************************************************
Street Name:                 Bailey Rd.                SR 4 WB Ramps-Canal Rd.
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected         Protected        Split Phase       Split Phase
Rights:           Include           Include           Include           Include
Min. Green:     0     0     0     0     0     0     0     0     0     0     0     0
Y+R:          4.0   4.0   4.0   4.0   4.0   4.0   4.0   4.0   4.0   4.0   4.0   4.0
Lanes:        2  0  2  1  0    1  0  1  1  0    0  0  0  0  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     530   910   230   160   860   280     0     0     0   290   360   330
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:  530   910   230   160   860   280     0     0     0   290   360   330
Added Vol:      0     0     0     0     0     0     0     0     0     0     0     0
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:  530   910   230   160   860   280     0     0     0   290   360   330
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98  0.98
PHF Volume:   541   929   235   163   878   286     0     0     0   296   367   337
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:  541   929   235   163   878   286     0     0     0   296   367   337
RTOR Reduct:    0     0     0     0     0     0     0     0     0     0     0     0
RTOR Vol:     541   929   235   163   878   286     0     0     0   296   367   337
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:  541   929   235   163   878   286     0     0     0   296   367   337
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720  1720  1720  1720  1720  1720  1720  1720  1720  1720  1720  1720
Adjustment:  0.91  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       2.00  2.39  0.61  1.00  1.51  0.49  0.00  0.00  0.00  0.59  0.74  0.67
Final Sat.:  3127  4119  1041  1720  2595   845     0     0     0  1018  1264  1158
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.17  0.23  0.23  0.09  0.34  0.34  0.00  0.00  0.00  0.29  0.29  0.29
Crit Volume:  270                           582           0                   500
Crit Moves:  ****                          ****                              ****
********************************************************************************
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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #11 Bailey Rd./SR 4 EB Ramps-Bart
********************************************************************************
Cycle (sec):        100                Critical Vol./Cap.(X):        0.548
Loss Time (sec):      0                Average Delay (sec/veh):     xxxxxx
Optimal Cycle:       50                Level Of Service:                 A
********************************************************************************
Street Name:               Bailey Rd.                    SR 4 EB Ramps-Bart
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:          Include          Ignore            Ovl             Ignore
Min. Green:    0     0     0     0     0     0     0     0     0     0     0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        0  0  2  0  1    2  0  2  0  1    0  1  1  0  1    0  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0 1100   320   180 1160   450    70  110   210     0    0   250
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0 1100   320   180 1160   450    70  110   210     0    0   250
Added Vol:     0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   0 1100   320   180 1160   450    70  110   210     0    0   250
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:    0 1158   337   189 1221   474    74  116   221     0    0   263
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0 1158   337   189 1221   474    74  116   221     0    0   263
RTOR Reduct:   0    0     0     0    0     0     0    0     0     0    0     0
RTOR Vol:      0 1158   337   189 1221   474    74  116   221     0    0   263
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   0 1158   337   189 1221   474    74  116   221     0    0   263
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 2.00  1.00  2.00 2.00  1.00  0.78 1.22  1.00  0.00 0.00  1.00
Final Sat.:    0 3300  1650  3000 3300  1650  1283 2017  1650     0    0  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.35  0.20  0.06 0.37  0.29  0.06 0.06  0.13  0.00 0.00  0.16
Crit Volume:       579         95                             221         0
Crit Moves:       ****        ****                           ****        ****
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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #13 Bailey Rd./W Leland Rd.
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         1.079
Loss Time (sec):        0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        180                Level Of Service:                  F
********************************************************************************
Street Name:                Bailey Rd.                       W Leland Rd.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0    0    0    0    0    0    0    0    0    0    0
Y+R:          4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0
Lanes:        1  0  1  1  0   2  0  1  0  1   1  0  1  1  0   1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     180  430   40  220  740  330  370  660  320  110  980  480
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:  180  430   40  220  740  330  370  660  320  110  980  480
Added Vol:      0    0    0    0    0    0    0    0    0    0    0    0
PasserByVol:    0    0    0    0    0    0    0    0    0    0    0    0
Initial Fut:  180  430   40  220  740  330  370  660  320  110  980  480
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:   180  430   40  220  740  330  370  660  320  110  980  480
Reduct Vol:     0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:  180  430   40  220  740  330  370  660  320  110  980  480
RTOR Reduct:    0    0    0    0    0  330    0    0    0    0    0  121
RTOR Vol:     180  430   40  220  740    0  370  660  320  110  980  359
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume:  180  430   40  220  740    0  370  660  320  110  980  359
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650 1650
Adjustment:  1.00 1.00 1.00 0.91 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes:       1.00 1.83 0.17 2.00 1.00 1.00 1.00 1.35 0.65 1.00 2.00 1.00
Final Sat.:  1650 3019  281 3000 1650 1650 1650 2222 1078 1650 3300 1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.11 0.14 0.14 0.07 0.45 0.00 0.22 0.30 0.30 0.07 0.30 0.22
Crit Volume:  180                 740        370                   490
Crit Moves:  ****                ****       ****                  ****
********************************************************************************
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Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

****

Intersection #14 Chestnut Dr./W Leland Rd.

****

Cycle (sec):	100	Critical Vol./Cap.(X):	0.548
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	41	Level Of Service:	A

****

Street Name:	Chestnut Dr.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0 1 0 0 1			0 0 1! 0 0			1 0 1 1 0			1 0 1 1 0		
Volume Module:												
Base Vol:	60	0	10	10	0	10	10	840	20	10	1450	10
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	60	0	10	10	0	10	10	840	20	10	1450	10
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	60	0	10	10	0	10	10	840	20	10	1450	10
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
PHF Volume:	69	0	11	11	0	11	11	966	23	11	1667	11
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	69	0	11	11	0	11	11	966	23	11	1667	11
RTOR Reduct:	0	0	11	0	0	0	0	0	0	0	0	0
RTOR Vol:	69	0	0	11	0	11	11	966	23	11	1667	11
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	69	0	0	11	0	11	11	966	23	11	1667	11
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.00	1.00	0.50	0.00	0.50	1.00	1.95	0.05	1.00	1.99	0.01
Final Sat.:	1720	0	1720	860	0	860	1720	3360	80	1720	3416	24
Capacity Analysis Module:												
Vol/Sat:	0.04	0.00	0.00	0.01	0.00	0.01	0.01	0.29	0.29	0.01	0.49	0.49
Crit Volume:	69					23	11				839	
Crit Moves:	****					****	****				****	

****

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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #16 Bailey Rd./Concord Blvd.
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):         1.239
Loss Time (sec):       0              Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       180              Level Of Service:                  F
********************************************************************************
Street Name:              Bailey Rd.                     Concord Blvd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        0  0  1! 0  0    0  1  0  0  1    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      90  200    40   340  340   520   300  440    80   110 1280   190
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   90  200    40   340  340   520   300  440    80   110 1280   190
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   90  200    40   340  340   520   300  440    80   110 1280   190
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:    90  200    40   340  340   520   300  440    80   110 1280   190
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   90  200    40   340  340   520   300  440    80   110 1280   190
RTOR Reduct:    0    0     0     0    0   300     0    0     0     0    0     0
RTOR Vol:      90  200    40   340  340   220   300  440    80   110 1280   190
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   90  200    40   340  340   220   300  440    80   110 1280   190
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.27 0.61  0.12  0.50 0.50  1.00  1.00 1.69  0.31  1.00 1.74  0.26
Final Sat.:   450 1000   200   825  825  1650  1650 2792   508  1650 2873   427
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.20 0.20  0.20  0.41 0.41  0.13  0.18 0.16  0.16  0.07 0.45  0.45
Crit Volume:       330               680         300                         735
Crit Moves:       ****              ****        ****                        ****
********************************************************************************
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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #1 Willow Pass Rd./SR 4 EB Ramps
********************************************************************************
Cycle (sec):          180                 Critical Vol./Cap.(X):        1.262
Loss Time (sec):        0                 Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        180                 Level Of Service:                 F
********************************************************************************
Street Name:          Willow Pass Rd.                    SR 4 EB Ramps
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase       Split Phase
Rights:          Include           Ignore          Include           Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  2  1  0    0  0  2  0  1    2  0  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  820   350    0  630   110  1150    0  1780    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0  820   350    0  630   110  1150    0  1780    0    0     0
Added Vol:      0    0     0    0    0     0     0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0     0    0     0    0    0     0
Initial Fut:    0  820   350    0  630   110  1150    0  1780    0    0     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:     0  820   350    0  630   110  1150    0  1780    0    0     0
Reduct Vol:     0    0     0    0    0     0     0    0     0    0    0     0
Reduced Vol:    0  820   350    0  630   110  1150    0  1780    0    0     0
RTOR Reduct:    0    0     0    0    0     0     0    0     0    0    0     0
RTOR Vol:       0  820   350    0  630   110  1150    0  1780    0    0     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    0  820   350    0  630   110  1150    0  1780    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720  1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00  0.91 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 2.10  0.90 0.00 2.00  1.00  2.00 0.00  1.00 0.00 0.00  0.00
Final Sat.:     0 3616  1544    0 3440  1720  3127    0  1720    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.23  0.23 0.00 0.18  0.06  0.37 0.00  1.03 0.00 0.00  0.00
Crit Volume:             390    0                          1780         0
Crit Moves:             ****  ****                         ****
********************************************************************************
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Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #2 San Marco Blvd./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.850
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	152	Level Of Service:	D

Street Name:	San Marco Blvd.		W Leland Rd.	
Approach:	North Bound	South Bound	East Bound	West Bound
Control:	Protected	Protected	Protected	Protected
Rights:	Include	Include	Include	Include
Lanes:	2 0 1 1 0	2 0 1 1 0	1 0 1 1 0	1 0 2 0 1

Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	150	500	220	940	870	330	220	240	30	320	440	390
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	150	500	220	940	870	330	220	240	30	320	440	390
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	150	500	220	940	870	330	220	240	30	320	440	390
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	158	526	232	989	916	347	232	253	32	337	463	411
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	158	526	232	989	916	347	232	253	32	337	463	411
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	411
RTOR Vol:	158	526	232	989	916	347	232	253	32	337	463	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	158	526	232	989	916	347	232	253	32	337	463	0
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	0.91	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	1.39	0.61	2.00	1.45	0.55	1.00	1.78	0.22	1.00	2.00	1.00
Final Sat.:	3000	2292	1008	3000	2393	908	1650	2933	367	1650	3300	1650
Capacity Analysis Module:												
Vol/Sat:	0.05	0.23	0.23	0.33	0.38	0.38	0.14	0.09	0.09	0.20	0.14	0.00
Crit Volume:			379	495					142	337		
Crit Moves:			****	****					****	****		

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #3 Alves Ranch Rd./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.688
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	73	Level Of Service:	B

Street Name:	Alves Ranch Rd.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1 0	1	1 0	0 1	0	1 0	2 0	1	1 0	1 1	0
Volume Module:												
Base Vol:	100	0	80	60	0	70	120	1470	170	140	1140	100
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	100	0	80	60	0	70	120	1470	170	140	1140	100
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	100	0	80	60	0	70	120	1470	170	140	1140	100
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	109	0	87	65	0	76	130	1598	185	152	1239	109
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	109	0	87	65	0	76	130	1598	185	152	1239	109
RTOR Reduct:	0	0	87	0	0	0	0	0	109	0	0	0
RTOR Vol:	109	0	0	65	0	76	130	1598	76	152	1239	109
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	109	0	0	65	0	76	130	1598	76	152	1239	109
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.00	1.00	1.00	0.00	1.00	1.00	2.00	1.00	1.00	1.84	0.16
Final Sat.:	1650	1650	1650	1650	0	1650	1650	3300	1650	1650	3034	266
Capacity Analysis Module:												
Vol/Sat:	0.07	0.00	0.00	0.04	0.00	0.05	0.08	0.48	0.05	0.09	0.41	0.41
Crit Volume:	109					76		799		152		
Crit Moves:	****					****		****		****		

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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #4 Woodhill Dr./W Leland Rd.
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):        0.585
Loss Time (sec):       0                Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        55                Level Of Service:                 A
********************************************************************************
Street Name:            Woodhill Dr.                      W Leland Rd.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase        Protected         Protected
Rights:           Include          Include          Include           Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        1  0  0  0  1    0  0  0  0  0    0  0  1  1  0    1  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      60    0    30     0    0     0     0 1490   120    50 1320     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   60    0    30     0    0     0     0 1490   120    50 1320     0
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   60    0    30     0    0     0     0 1490   120    50 1320     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91  0.91 0.91  0.91
PHF Volume:    66    0    33     0    0     0     0 1637   132    55 1451     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   66    0    33     0    0     0     0 1637   132    55 1451     0
RTOR Reduct:    0    0    33     0    0     0     0    0     0     0    0     0
RTOR Vol:      66    0     0     0    0     0     0 1637   132    55 1451     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   66    0     0     0    0     0     0 1637   132    55 1451     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 0.00  1.00  0.00 0.00  0.00  0.00 1.85  0.15  1.00 2.00  0.00
Final Sat.:  1720    0  1720     0    0     0     0 3184   256  1720 3440     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04 0.00  0.00  0.00 0.00  0.00  0.00 0.51  0.51  0.03 0.42  0.00
Crit Volume:   66                   0                         885    55
Crit Moves:  ****                                            ****  ****
********************************************************************************
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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #5 Southwood Dr./W Leland Rd.
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):        0.651
Loss Time (sec):       0               Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        53               Level Of Service:                  B
********************************************************************************
Street Name:             Southwood Dr.                    W Leland Rd.
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted         Protected         Protected
Rights:           Include          Include           Include           Include
Min. Green:     0     0     0     0     0     0     0     0     0     0     0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        0  0  1! 0  0    0  0  0  0  0    0  0  1  1  0    1  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      60     0    90     0     0     0     0 1400   120   120 1310     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   60     0    90     0     0     0     0 1400   120   120 1310     0
Added Vol:      0     0     0     0     0     0     0    0     0     0    0     0
PasserByVol:    0     0     0     0     0     0     0    0     0     0    0     0
Initial Fut:   60     0    90     0     0     0     0 1400   120   120 1310     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:    65     0    98     0     0     0     0 1522   130   130 1424     0
Reduct Vol:     0     0     0     0     0     0     0    0     0     0    0     0
Reduced Vol:   65     0    98     0     0     0     0 1522   130   130 1424     0
RTOR Reduct:    0     0     0     0     0     0     0    0     0     0    0     0
RTOR Vol:      65     0    98     0     0     0     0 1522   130   130 1424     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   65     0    98     0     0     0     0 1522   130   130 1424     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.40 0.00  0.60  0.00 0.00  0.00  0.00 1.84  0.16  1.00 2.00  0.00
Final Sat.:   688     0  1032     0     0     0     0 3168   272  1720 3440     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.09 0.00  0.09  0.00 0.00  0.00  0.00 0.48  0.48  0.08 0.41  0.00
Crit Volume:             163     0                            826   130
Crit Moves:             ****                                 ****  ****
********************************************************************************
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Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #6 West Bart Driveway/W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.739
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	71	Level Of Service:	C

Street Name:	West Bart Driveway						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Permitted			Permitted			Protected			Protected	
Rights:		Include			Include			Include			Include	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0 0 0 0 0			1 0 0 0 1			0 0 2 0 0			0 0 2 0 0		
Volume Module:												
Base Vol:	0	0	0	450	0	80	0	1490	0	0	1350	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	450	0	80	0	1490	0	0	1350	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	450	0	80	0	1490	0	0	1350	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	0	0	0	479	0	85	0	1585	0	0	1436	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	479	0	85	0	1585	0	0	1436	0
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Vol:	0	0	0	479	0	85	0	1585	0	0	1436	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	479	0	85	0	1585	0	0	1436	0
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	0.00	2.00	0.00	0.00	2.00	0.00
Final Sat.:	0	0	0	1720	0	1720	0	3440	0	0	3440	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.28	0.00	0.05	0.00	0.46	0.00	0.00	0.42	0.00
Crit Volume:		0		479				793		0		
Crit Moves:				****				****		****		

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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #7 East Bart Driveway/W Leland Rd.
********************************************************************************
Cycle (sec):          100                 Critical Vol./Cap.(X):         0.561
Loss Time (sec):        0                 Average Delay (sec/veh):      xxxxxx
Optimal Cycle:         52                 Level Of Service:                  A
********************************************************************************
Street Name:        East Bart Driveway                  W Leland Rd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0    0     0    0    0     0    0    0     0    0    0
Y+R:          4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0
Lanes:        0  0  0  0  0   0  0  0  0  0   1  0  2  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0    0     0    0    0    40 1900    0     0 1350  100
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:    0    0    0     0    0    0    40 1900    0     0 1350  100
Added Vol:      0    0    0     0    0    0     0    0    0     0    0    0
PasserByVol:    0    0    0     0    0    0     0    0    0     0    0    0
Initial Fut:    0    0    0     0    0    0    40 1900    0     0 1350  100
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     0.94 0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94  0.94 0.94 0.94
PHF Volume:     0    0    0     0    0    0    43 2021    0     0 1436  106
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:    0    0    0     0    0    0    43 2021    0     0 1436  106
RTOR Reduct:    0    0    0     0    0    0     0    0    0     0    0    0
RTOR Vol:       0    0    0     0    0    0    43 2021    0     0 1436  106
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:    0    0    0     0    0    0    43 2021    0     0 1436  106
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800 1800  1800 1800 1800  1800 1800 1800  1800 1800 1800
Adjustment:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Lanes:       0.00 0.00 0.00  0.00 0.00 0.00  1.00 2.00 0.00  0.00 1.86 0.14
Final Sat.:     0    0    0     0    0    0  1800 3600    0     0 3352  248
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00 0.00  0.00 0.00 0.00  0.02 0.56 0.00  0.00 0.43 0.43
Crit Volume:         0               0             1011           0
Crit Moves:                                        ****         ****
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Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #9 Bailey Rd./Willow Pass Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.789
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	108	Level Of Service:	C

Street Name:	Bailey Rd.						Willow Pass Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1 0	1	1 0	0 1	0	1 0	1 1	0	1 0	1 1	0
Volume Module:												
Base Vol:	440	30	310	30	20	20	20	600	340	300	400	20
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	440	30	310	30	20	20	20	600	340	300	400	20
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	440	30	310	30	20	20	20	600	340	300	400	20
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	458	31	323	31	21	21	21	625	354	313	417	21
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	458	31	323	31	21	21	21	625	354	313	417	21
RTOR Reduct:	0	0	313	0	0	0	0	0	0	0	0	0
RTOR Vol:	458	31	10	31	21	21	21	625	354	313	417	21
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	458	31	10	31	21	21	21	625	354	313	417	21
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.00	1.00	1.00	0.50	0.50	1.00	1.28	0.72	1.00	1.90	0.10
Final Sat.:	1650	1650	1650	1650	825	825	1650	2106	1194	1650	3143	157
Capacity Analysis Module:												
Vol/Sat:	0.28	0.02	0.01	0.02	0.03	0.03	0.01	0.30	0.30	0.19	0.13	0.13
Crit Volume:	458				42			490		313		
Crit Moves:	****				****			****		****		

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #10 Bailey Rd./SR 4 WB Ramps-Canal Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.781
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	104	Level Of Service:	C

Street Name:	Bailey Rd.						SR 4 WB Ramps-Canal Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	2 0	2	1 0	1 0	1	1 0	0 0	0	0 0	0 1	0	1 0
Volume Module:												
Base Vol:	290	1240	870	180	810	190	0	0	0	230	170	80
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	290	1240	870	180	810	190	0	0	0	230	170	80
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	290	1240	870	180	810	190	0	0	0	230	170	80
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	302	1292	906	188	844	198	0	0	0	240	177	83
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	302	1292	906	188	844	198	0	0	0	240	177	83
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Vol:	302	1292	906	188	844	198	0	0	0	240	177	83
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	302	1292	906	188	844	198	0	0	0	240	177	83
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.00	1.00	1.00	1.62	0.38	0.00	0.00	0.00	0.96	0.71	0.33
Final Sat.:	3127	3440	1720	1720	2786	654	0	0	0	1648	1218	573
Capacity Analysis Module:												
Vol/Sat:	0.10	0.38	0.53	0.11	0.30	0.30	0.00	0.00	0.00	0.15	0.15	0.15
Crit Volume:			906	188				0			250	
Crit Moves:			****	****							****	

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #11 Bailey Rd./SR 4 EB Ramps-Bart

Cycle (sec):	100	Critical Vol./Cap.(X):	0.833
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	137	Level Of Service:	D

Street Name:	Bailey Rd.						SR 4 EB Ramps-Bart					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Ignore			Ovl			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0 0	2 0	1	2 0	2 0	1	0 1	1 0	1	0 0	0 0	1
Volume Module:												
Base Vol:	0	1050	380	190	1100	240	120	190	690	0	0	950
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1050	380	190	1100	240	120	190	690	0	0	950
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1050	380	190	1100	240	120	190	690	0	0	950
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	0	1094	396	198	1146	250	125	198	719	0	0	990
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1094	396	198	1146	250	125	198	719	0	0	990
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Vol:	0	1094	396	198	1146	250	125	198	719	0	0	990
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	1094	396	198	1146	250	125	198	719	0	0	990
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	2.00	1.00	2.00	2.00	1.00	0.77	1.23	1.00	0.00	0.00	1.00
Final Sat.:	0	3300	1650	3000	3300	1650	1277	2023	1650	0	0	1650
Capacity Analysis Module:												
Vol/Sat:	0.00	0.33	0.24	0.07	0.35	0.15	0.10	0.10	0.44	0.00	0.00	0.60
Crit Volume:		547		99					719		0	
Crit Moves:		****		****					****		****	

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #12 Bailey Rd./Maylard St.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.568
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	53	Level Of Service:	A

Street Name:	Bailey Rd.						Maylard St.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1 1	0	1 0	2 1	0	1 1	0 0	1	0 0	1! 0	0
Volume Module:												
Base Vol:	60	1100	20	80	1530	180	280	5	140	10	5	50
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	60	1100	20	80	1530	180	280	5	140	10	5	50
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	60	1100	20	80	1530	180	280	5	140	10	5	50
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	65	1196	22	87	1663	196	304	5	152	11	5	54
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	65	1196	22	87	1663	196	304	5	152	11	5	54
RTOR Reduct:	0	0	0	0	0	0	0	0	65	0	0	0
RTOR Vol:	65	1196	22	87	1663	196	304	5	87	11	5	54
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	65	1196	22	87	1663	196	304	5	87	11	5	54
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.96	0.04	1.00	2.68	0.32	1.96	0.04	1.00	0.15	0.08	0.77
Final Sat.:	1650	3241	59	1650	4429	521	2947	58	1650	254	127	1269
Capacity Analysis Module:												
Vol/Sat:	0.04	0.37	0.37	0.05	0.38	0.38	0.10	0.09	0.05	0.04	0.04	0.04
Crit Volume:			609	87			155					71
Crit Moves:			****	****			****					****

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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #13 Bailey Rd./W Leland Rd.
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):        0.909
Loss Time (sec):       0                Average Delay (sec/veh):     xxxxxx
Optimal Cycle:       180                Level Of Service:                 E
********************************************************************************
Street Name:                Bailey Rd.                       W Leland Rd.
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected         Protected         Protected         Protected
Rights:           Include           Include           Include           Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        1  0  1  1  0    2  0  1  0  1    1  0  1  1  0    1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     320  330   100   800  350   530   380 1390   180    60  720   470
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  320  330   100   800  350   530   380 1390   180    60  720   470
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  320  330   100   800  350   530   380 1390   180    60  720   470
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   320  330   100   800  350   530   380 1390   180    60  720   470
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  320  330   100   800  350   530   380 1390   180    60  720   470
RTOR Reduct:    0    0     0     0    0   380     0    0     0     0    0   440
RTOR Vol:     320  330   100   800  350   150   380 1390   180    60  720    30
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  320  330   100   800  350   150   380 1390   180    60  720    30
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.53  0.47  2.00 1.00  1.00  1.00 1.77  0.23  1.00 2.00  1.00
Final Sat.:  1650 2533   767  3000 1650  1650  1650 2922   378  1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.19 0.13  0.13  0.27 0.21  0.09  0.23 0.48  0.48  0.04 0.22  0.02
Crit Volume:             215   400                    785          60
Crit Moves:             ****  ****                   ****        ****
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Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #14 Chestnut Dr./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.720
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	67	Level Of Service:	C

Street Name:	Chestnut Dr.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0 1	0	0 1	0 0	1!	0 0	1 0	1	1 0	1 0	1	1 0
Volume Module:												
Base Vol:	20	0	10	10	0	10	10	2140	40	10	1150	10
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	20	0	10	10	0	10	10	2140	40	10	1150	10
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	20	0	10	10	0	10	10	2140	40	10	1150	10
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	22	0	11	11	0	11	11	2326	43	11	1250	11
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	22	0	11	11	0	11	11	2326	43	11	1250	11
RTOR Reduct:	0	0	11	0	0	0	0	0	0	0	0	0
RTOR Vol:	22	0	0	11	0	11	11	2326	43	11	1250	11
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	22	0	0	11	0	11	11	2326	43	11	1250	11
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.00	1.00	0.50	0.00	0.50	1.00	1.96	0.04	1.00	1.98	0.02
Final Sat.:	1720	0	1720	860	0	860	1720	3377	63	1720	3410	30
Capacity Analysis Module:												
Vol/Sat:	0.01	0.00	0.00	0.01	0.00	0.01	0.01	0.69	0.69	0.01	0.37	0.37
Crit Volume:	22					22			1185	11		
Crit Moves:	****					****			****	****		

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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
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Intersection #16 Bailey Rd./Concord Blvd.
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Cycle (sec):         100               Critical Vol./Cap.(X):        0.961
Loss Time (sec):       0               Average Delay (sec/veh):     xxxxxx
Optimal Cycle:       180               Level Of Service:                 E
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Street Name:                Bailey Rd.                     Concord Blvd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  1! 0  0   0  1  0  0  1   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     100  360    80   130  280   120   250 1050   120    50  500   240
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  100  360    80   130  280   120   250 1050   120    50  500   240
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  100  360    80   130  280   120   250 1050   120    50  500   240
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   100  360    80   130  280   120   250 1050   120    50  500   240
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  100  360    80   130  280   120   250 1050   120    50  500   240
RTOR Reduct:    0    0     0     0    0   120     0    0     0     0    0     0
RTOR Vol:     100  360    80   130  280     0   250 1050   120    50  500   240
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  100  360    80   130  280     0   250 1050   120    50  500   240
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.18 0.67  0.15  0.32 0.68  1.00  1.00 1.79  0.21  1.00 1.35  0.65
Final Sat.:   306 1100   244   523 1127  1650  1650 2962   338  1650 2230  1070
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.33 0.33  0.33  0.25 0.25  0.00  0.15 0.35  0.35  0.03 0.22  0.22
Crit Volume:             540        410               585         50
Crit Moves:             ****       ****              ****       ****
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APPENDIX G:
CUMULATIVE PLUS PROJECT
LEVEL OF SERVICE
CALCULATION SHEETS

FEHR PEERS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	380	0	474	0	0	0	0	2101	280	0	470	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5		3.5					5.0			5.0	4.0
Lane Util. Factor	0.97		1.00					0.91			0.95	1.00
Frt	1.00		0.85					0.98			1.00	0.85
Flt Protected	0.95		1.00					1.00			1.00	1.00
Satd. Flow (prot)	3433		1583					4996			3539	1583
Flt Permitted	0.95		1.00					1.00			1.00	1.00
Satd. Flow (perm)	3433		1583					4996			3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	400	0	499	0	0	0	0	2212	295	0	495	295
RTOR Reduction (vph)	0	0	87	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	400	0	412	0	0	0	0	2507	0	0	495	295
Turn Type	Prot		custom									Free
Protected Phases	4		4					2			6	
Permitted Phases												Free
Actuated Green, G (s)	23.2		23.2					31.4			31.4	63.1
Effective Green, g (s)	23.2		23.2					31.4			31.4	63.1
Actuated g/C Ratio	0.37		0.37					0.50			0.50	1.00
Clearance Time (s)	3.5		3.5					5.0			5.0	
Vehicle Extension (s)	4.0		4.0					4.0			4.0	
Lane Grp Cap (vph)	1262		582					2486			1761	1583
v/s Ratio Prot	0.12		c0.26					c0.50			0.14	
v/s Ratio Perm												0.19
v/c Ratio	0.32		0.71					1.01			0.28	0.19
Uniform Delay, d1	14.3		17.1					15.9			9.3	0.0
Progression Factor	1.00		1.00					1.00			1.00	1.00
Incremental Delay, d2	0.2		4.2					20.1			0.1	0.3
Delay (s)	14.5		21.3					36.0			9.4	0.3
Level of Service	B		C					D			A	A
Approach Delay (s)		18.3			0.0			36.0			6.0	
Approach LOS		B			A			D			A	

Intersection Summary			
HCM Average Control Delay	26.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	63.1	Sum of lost time (s)	8.5
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	340	140	331	110	1161	60	910	351	374	510	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	6.0		5.5	6.0	6.0	5.5	7.0		5.5	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	0.97	0.95		0.97	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3385		1770	3539	1583	3433	3392		3433	3492	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3385		1770	3539	1583	3433	3392		3433	3492	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	221	358	147	348	116	1222	63	958	369	394	537	53
RTOR Reduction (vph)	0	32	0	0	0	497	0	29	0	0	5	0
Lane Group Flow (vph)	221	473	0	348	116	725	63	1298	0	394	585	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	18.5	27.0		26.5	35.0	35.0	5.6	49.9		12.7	57.0	
Effective Green, g (s)	18.5	27.0		26.5	35.0	35.0	5.6	49.9		12.7	57.0	
Actuated g/C Ratio	0.13	0.19		0.19	0.25	0.25	0.04	0.36		0.09	0.41	
Clearance Time (s)	5.5	6.0		5.5	6.0	6.0	5.5	7.0		5.5	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	4.5		3.0	4.5	
Lane Grp Cap (vph)	234	652		335	884	395	137	1208		311	1421	
v/s Ratio Prot	0.12	0.14		c0.20	0.03		0.02	c0.38		c0.11	0.17	
v/s Ratio Perm						c0.46						
v/c Ratio	0.94	0.73		1.04	0.13	1.84	0.46	1.07		1.27	0.41	
Uniform Delay, d1	60.3	53.1		56.8	40.8	52.5	65.8	45.1		63.7	29.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	43.3	4.0		59.6	0.1	386.1	2.4	48.4		143.1	0.3	
Delay (s)	103.6	57.1		116.4	40.8	438.7	68.2	93.5		206.8	29.9	
Level of Service	F	E		F	D	F	E	F		F	C	
Approach Delay (s)		71.2			344.8			92.4			100.8	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	179.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	140.1	Sum of lost time (s)	24.0
Intersection Capacity Utilization	135.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	935	190	121	1632	0	200	0	211	100	0	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	5.0	6.0		5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00		1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00		0.85	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539		1770		1583	1770	1583	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3539		1770		1583	1770	1583	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	984	200	127	1718	0	211	0	222	105	0	126
RTOR Reduction (vph)	0	0	115	0	0	0	0	0	179	0	112	0
Lane Group Flow (vph)	42	984	85	127	1718	0	211	0	43	105	14	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2						4			
Actuated Green, G (s)	3.9	40.3	40.3	11.0	47.4		12.1		13.4	9.1	10.4	
Effective Green, g (s)	3.9	40.3	40.3	11.0	47.4		12.1		13.4	9.1	10.4	
Actuated g/C Ratio	0.04	0.43	0.43	0.12	0.50		0.13		0.14	0.10	0.11	
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0		5.0		5.0	5.0	5.0	
Vehicle Extension (s)	3.0	2.0	2.0	3.0	2.0		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	73	1504	673	205	1770		226		224	170	174	
v/s Ratio Prot	0.02	0.28		c0.07	c0.49		c0.12			0.06	0.01	
v/s Ratio Perm			0.05						c0.03			
v/c Ratio	0.58	0.65	0.13	0.62	0.97		0.93		0.19	0.62	0.08	
Uniform Delay, d1	44.6	21.7	16.6	39.9	23.0		41.0		35.9	41.2	37.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2	10.5	0.8	0.0	5.5	14.9		41.6		0.4	6.5	0.2	
Delay (s)	55.1	22.5	16.6	45.4	38.0		82.5		36.3	47.7	38.1	
Level of Service	E	C	B	D	D		F		D	D	D	
Approach Delay (s)		22.6			38.5			58.8			42.5	
Approach LOS		C			D			E			D	

Intersection Summary			
HCM Average Control Delay	35.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	94.8	Sum of lost time (s)	21.0
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1176	70	31	1573	180	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		5.0	6.0	5.0	5.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3509		1770	3539	1770	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3509		1770	3539	1770	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1238	74	33	1656	189	64
RTOR Reduction (vph)	4	0	0	0	0	53
Lane Group Flow (vph)	1308	0	33	1656	189	11
Turn Type			Prot			Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	38.6		3.1	46.7	11.9	11.9
Effective Green, g (s)	38.6		3.1	46.7	11.9	11.9
Actuated g/C Ratio	0.55		0.04	0.67	0.17	0.17
Clearance Time (s)	6.0		5.0	6.0	5.0	5.0
Vehicle Extension (s)	4.0		3.0	4.0	3.0	3.0
Lane Grp Cap (vph)	1946		79	2375	303	271
v/s Ratio Prot	0.37		0.02	c0.47	c0.11	
v/s Ratio Perm						0.01
v/c Ratio	0.67		0.42	0.70	0.62	0.04
Uniform Delay, d1	11.0		32.4	7.1	26.8	24.1
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0		3.5	1.0	4.0	0.1
Delay (s)	12.0		35.9	8.1	30.7	24.1
Level of Service	B		D	A	C	C
Approach Delay (s)	12.0			8.6	29.1	
Approach LOS	B			A	C	

Intersection Summary			
HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	69.6	Sum of lost time (s)	11.0
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1242	60	31	1372	190	141
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	0.99		1.00	1.00	0.94	
Flt Protected	1.00		0.95	1.00	0.97	
Satd. Flow (prot)	3515		1770	3539	1707	
Flt Permitted	1.00		0.95	1.00	0.97	
Satd. Flow (perm)	3515		1770	3539	1707	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1307	63	33	1444	200	148
RTOR Reduction (vph)	4	0	0	0	37	0
Lane Group Flow (vph)	1366	0	33	1444	311	0
Turn Type			Prot			
Protected Phases	2		1		7	
Permitted Phases				6		
Actuated Green, G (s)	33.5		2.6	34.8	16.6	
Effective Green, g (s)	33.5		2.6	34.8	16.6	
Actuated g/C Ratio	0.49		0.04	0.51	0.25	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Vehicle Extension (s)	2.0		3.0	2.0	3.0	
Lane Grp Cap (vph)	1739		68	1819	419	
v/s Ratio Prot	0.39		c0.02		c0.18	
v/s Ratio Perm				c0.41		
v/c Ratio	0.79		0.49	0.79	0.74	
Uniform Delay, d1	14.1		31.9	13.5	23.6	
Progression Factor	1.00		1.45	0.24	1.00	
Incremental Delay, d2	2.2		3.3	1.4	7.0	
Delay (s)	16.4		49.7	4.7	30.5	
Level of Service	B		D	A	C	
Approach Delay (s)	16.4			5.7	30.5	
Approach LOS	B			A	C	

Intersection Summary			
HCM Average Control Delay	13.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	67.7	Sum of lost time (s)	10.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	30	1353	1357	10	23	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	3535		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	3535		1770	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	1424	1428	11	24	48
RTOR Reduction (vph)	0	0	0	0	0	36
Lane Group Flow (vph)	32	1424	1439	0	24	12
Confl. Peds. (#/hr)				1	9	
Confl. Bikes (#/hr)				1		
Turn Type	Prot					Perm
Protected Phases	5	2	6		3	
Permitted Phases						3
Actuated Green, G (s)	2.3	33.5	34.8		16.6	16.6
Effective Green, g (s)	2.3	33.5	34.8		16.6	16.6
Actuated g/C Ratio	0.03	0.49	0.51		0.25	0.25
Clearance Time (s)	4.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	2.0	2.0		3.0	3.0
Lane Grp Cap (vph)	60	1751	1817		434	388
v/s Ratio Prot	c0.02	0.40	c0.41		c0.01	
v/s Ratio Perm						0.01
v/c Ratio	0.53	0.81	0.79		0.06	0.03
Uniform Delay, d1	32.2	14.5	13.5		19.6	19.4
Progression Factor	1.32	0.40	1.00		1.00	1.00
Incremental Delay, d2	5.8	1.9	2.3		0.1	0.0
Delay (s)	48.4	7.6	15.8		19.6	19.5
Level of Service	D	A	B		B	B
Approach Delay (s)		8.5	15.8		19.5	
Approach LOS		A	B		B	

Intersection Summary			
HCM Average Control Delay	12.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	67.7	Sum of lost time (s)	9.0
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	50	1326	1356	368	47	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.0	5.0		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.97		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	3386		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	3386		1770	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	53	1396	1427	387	49	11
RTOR Reduction (vph)	0	0	20	0	0	10
Lane Group Flow (vph)	53	1396	1794	0	49	1
Confl. Peds. (#/hr)				19	24	
Confl. Bikes (#/hr)				1		
Turn Type	Prot					Perm
Protected Phases	1	6	2		3	
Permitted Phases						3
Actuated Green, G (s)	4.3	43.2	34.4		8.3	8.3
Effective Green, g (s)	4.3	43.2	34.4		8.3	8.3
Actuated g/C Ratio	0.07	0.71	0.56		0.14	0.14
Clearance Time (s)	4.5	5.0	5.0		4.5	4.5
Vehicle Extension (s)	3.0	2.0	2.0		3.0	3.0
Lane Grp Cap (vph)	125	2506	1909		241	215
v/s Ratio Prot	0.03	c0.39	c0.53		c0.03	
v/s Ratio Perm						0.00
v/c Ratio	0.42	0.56	0.94		0.20	0.01
Uniform Delay, d1	27.2	4.3	12.3		23.4	22.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.3	0.2	9.5		0.4	0.0
Delay (s)	29.5	4.4	21.9		23.8	22.8
Level of Service	C	A	C		C	C
Approach Delay (s)		5.4	21.9		23.6	
Approach LOS		A	C		C	

Intersection Summary			
HCM Average Control Delay	14.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	61.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	1305	40	80	1644	120	70	12	160	25	2	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		0.97	1.00	
Frt	1.00	1.00		1.00	0.99			0.91		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1770	3523		1770	3503			1673		3433	1634	
Flt Permitted	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (perm)	1770	3523		1770	3503			1673		3433	1634	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	1374	42	84	1731	126	74	13	168	26	2	9
RTOR Reduction (vph)	0	1	0	0	3	0	0	60	0	0	9	0
Lane Group Flow (vph)	29	1415	0	84	1854	0	0	195	0	26	2	0
Turn Type	Prot			Prot			Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases												
Actuated Green, G (s)	4.1	47.2		7.7	50.8			15.3		3.8	3.8	
Effective Green, g (s)	4.1	47.2		7.7	50.8			15.3		3.8	3.8	
Actuated g/C Ratio	0.05	0.52		0.08	0.56			0.17		0.04	0.04	
Clearance Time (s)	4.0	5.0		4.0	5.0			4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	80	1827		150	1956			281		143	68	
v/s Ratio Prot	0.02	0.40		c0.05	c0.53			c0.12		c0.01	0.00	
v/s Ratio Perm												
v/c Ratio	0.36	0.77		0.56	0.95			0.69		0.18	0.03	
Uniform Delay, d1	42.2	17.6		40.0	18.9			35.6		42.1	41.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	2.8	2.1		4.7	10.5			7.2		0.6	0.2	
Delay (s)	45.0	19.7		44.7	29.3			42.9		42.7	42.1	
Level of Service	D	B		D	C			D		D	D	
Approach Delay (s)		20.2			30.0			42.9			42.5	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	27.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	91.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	270	452	359	1040	20	769	10	399	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.91		1.00	1.00		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3207		1770	3529		1770	1863	1583	1770	1723	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3207		1770	3529		1770	1863	1583	1770	1723	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	284	476	378	1095	21	809	11	420	11	11	11
RTOR Reduction (vph)	0	224	0	0	1	0	0	0	245	0	11	0
Lane Group Flow (vph)	11	536	0	378	1115	0	809	11	175	11	11	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	0.7	25.6		18.1	43.0		46.3	46.3	46.3	4.0	4.0	
Effective Green, g (s)	0.7	25.6		18.1	43.0		46.3	46.3	46.3	4.0	4.0	
Actuated g/C Ratio	0.01	0.23		0.16	0.39		0.42	0.42	0.42	0.04	0.04	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	11	740		289	1367		738	777	660	64	62	
v/s Ratio Prot	0.01	0.17		c0.21	c0.32		c0.46	0.01		0.01	c0.01	
v/s Ratio Perm									0.11			
v/c Ratio	1.00	0.72		1.31	0.82		1.10	0.01	0.27	0.17	0.18	
Uniform Delay, d1	55.1	39.4		46.5	30.5		32.4	19.0	21.2	51.9	51.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	271.4	3.5		161.3	3.9		62.5	0.0	0.2	1.3	1.4	
Delay (s)	326.5	43.0		207.8	34.3		94.9	19.0	21.4	53.2	53.3	
Level of Service	F	D		F	C		F	B	C	D	D	
Approach Delay (s)		47.0			78.2			69.3			53.3	
Approach LOS		D			E			E			D	

Intersection Summary			
HCM Average Control Delay	68.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	111.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	102.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	290	360	330	559	947	230	160	941	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0		4.0	4.2		4.0	4.2	
Lane Util. Factor					0.95		0.97	0.91		1.00	0.95	
Frt					0.95		1.00	0.97		1.00	0.97	
Flt Protected					0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					3311		3433	4936		1770	3417	
Flt Permitted					0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)					3311		3433	4936		1770	3417	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	296	367	337	570	966	235	163	960	286
RTOR Reduction (vph)	0	0	0	0	0	0	0	32	0	0	17	0
Lane Group Flow (vph)	0	0	0	0	1000	0	570	1169	0	163	1229	0
Turn Type				Split			Prot			Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)					37.0		27.5	68.8		12.0	53.3	
Effective Green, g (s)					37.0		27.5	68.8		12.0	53.3	
Actuated g/C Ratio					0.28		0.21	0.53		0.09	0.41	
Clearance Time (s)					4.0		4.0	4.2		4.0	4.2	
Vehicle Extension (s)					3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)					942		726	2612		163	1401	
v/s Ratio Prot					c0.30		c0.17	0.24		c0.09	c0.36	
v/s Ratio Perm												
v/c Ratio					1.06		0.79	0.45		1.00	0.88	
Uniform Delay, d1					46.5		48.5	18.9		59.0	35.3	
Progression Factor					1.00		0.91	1.23		1.00	1.00	
Incremental Delay, d2					47.1		5.3	0.5		70.5	8.0	
Delay (s)					93.6		49.5	23.7		129.5	43.3	
Level of Service					F		D	C		F	D	
Approach Delay (s)		0.0			93.6			32.0			53.3	
Approach LOS		A			F			C			D	

Intersection Summary			
HCM Average Control Delay	53.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	139	264	0	0	250	0	1147	340	180	1402	277
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0			3.5		3.5	3.5	3.0	3.5	4.0
Lane Util. Factor		0.95	1.00			1.00		0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.99			1.00		1.00	0.99	1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85			0.86		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00			1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3471	1575			1611		3539	1560	3433	3539	1541
Flt Permitted		0.98	1.00			1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3471	1575			1611		3539	1560	3433	3539	1541
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	146	278	0	0	263	0	1207	358	189	1476	292
RTOR Reduction (vph)	0	0	15	0	0	21	0	0	78	0	0	0
Lane Group Flow (vph)	0	241	263	0	0	242	0	1207	280	189	1476	292
Confl. Peds. (#/hr)			1			1			1			3
Confl. Bikes (#/hr)			2			2			2			14
Turn Type	Split		custom			custom			custom	Prot		Free
Protected Phases	4!	4	5			2 6 4!		2 11!		1	6 11	
Permitted Phases			4						2			Free
Actuated Green, G (s)		15.0	41.0			99.5		93.0	66.0	12.5	76.0	130.0
Effective Green, g (s)		15.0	41.0			96.5		93.0	66.0	12.5	76.0	130.0
Actuated g/C Ratio		0.12	0.32			0.74		0.72	0.51	0.10	0.58	1.00
Clearance Time (s)		3.0	3.0						3.5	3.0		
Vehicle Extension (s)		3.0	3.0						5.0	3.0		
Lane Grp Cap (vph)		401	497			1196		2532	792	330	2069	1541
v/s Ratio Prot		c0.07	0.11			0.15		c0.34		0.06	c0.42	
v/s Ratio Perm			0.06						0.18			0.19
v/c Ratio		0.60	0.53			0.20		0.48	0.35	0.57	0.71	0.19
Uniform Delay, d1		54.7	36.6			5.1		8.0	19.2	56.2	19.2	0.0
Progression Factor		1.00	1.00			1.00		0.82	1.37	1.11	1.52	1.00
Incremental Delay, d2		2.5	1.0			0.1		0.1	1.1	1.9	1.0	0.2
Delay (s)		57.2	37.6			5.2		6.7	27.3	64.2	30.3	0.2
Level of Service		E	D			A		A	C	E	C	A
Approach Delay (s)		46.7			5.2			11.4			29.1	
Approach LOS		D			A			B			C	

Intersection Summary			
HCM Average Control Delay	23.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	64.2%	ICU Level of Service	C
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	5	40	20	5	70	30	1287	30	30	1526	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1	5.1		5.1		5.1	5.1		5.1	5.1	
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.91	
Frt	1.00	1.00	0.85		0.90		1.00	1.00		1.00	0.99	
Flt Protected	0.95	0.96	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1691	1583		1659		1770	3527		1770	5034	
Flt Permitted	0.95	0.96	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1691	1583		1659		1770	3527		1770	5034	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	137	5	42	21	5	74	32	1355	32	32	1606	116
RTOR Reduction (vph)	0	0	39	0	70	0	0	1	0	0	4	0
Lane Group Flow (vph)	71	71	3	0	30	0	32	1386	0	32	1718	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases			4									
Actuated Green, G (s)	9.6	9.6	9.6		6.7		4.7	88.0		5.3	88.6	
Effective Green, g (s)	9.6	9.6	9.6		6.7		4.7	88.0		5.3	88.6	
Actuated g/C Ratio	0.07	0.07	0.07		0.05		0.04	0.68		0.04	0.68	
Clearance Time (s)	5.1	5.1	5.1		5.1		5.1	5.1		5.1	5.1	
Vehicle Extension (s)	1.7	1.7	1.7		1.7		1.7	2.2		1.7	2.2	
Lane Grp Cap (vph)	124	125	117		86		64	2388		72	3431	
v/s Ratio Prot	c0.04	0.04			c0.02		0.02	c0.39		0.02	c0.34	
v/s Ratio Perm			0.00									
v/c Ratio	0.57	0.57	0.03		0.35		0.50	0.58		0.44	0.50	
Uniform Delay, d1	58.2	58.2	55.9		59.5		61.5	11.2		60.9	10.0	
Progression Factor	1.00	1.00	1.00		1.00		0.86	1.19		1.04	1.08	
Incremental Delay, d2	3.9	3.5	0.0		0.9		1.1	0.5		1.1	0.4	
Delay (s)	62.1	61.7	55.9		60.4		53.8	13.8		64.2	11.2	
Level of Service	E	E	E		E		D	B		E	B	
Approach Delay (s)		60.5			60.4			14.7			12.1	
Approach LOS		E			E			B			B	

Intersection Summary			
HCM Average Control Delay	17.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	437	678	375	110	1006	480	212	430	40	220	740	626
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3301		1770	3539	1559	1770	3490		3433	1863	1562
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3301		1770	3539	1559	1770	3490		3433	1863	1562
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	437	678	375	110	1006	480	212	430	40	220	740	626
RTOR Reduction (vph)	0	58	0	0	0	211	0	5	0	0	0	196
Lane Group Flow (vph)	437	995	0	110	1006	269	212	465	0	220	740	430
Confl. Peds. (#/hr)			8			2			1			1
Confl. Bikes (#/hr)			2			1						
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	20.9	45.9		9.5	34.5	34.5	10.9	40.7		12.7	42.5	42.5
Effective Green, g (s)	20.9	45.9		9.5	34.5	34.5	10.9	40.7		12.7	42.5	42.5
Actuated g/C Ratio	0.16	0.35		0.07	0.27	0.27	0.08	0.31		0.10	0.33	0.33
Clearance Time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Vehicle Extension (s)	3.0	2.2		3.0	2.2	2.2	3.0	2.2		3.0	2.2	2.2
Lane Grp Cap (vph)	285	1166		129	939	414	148	1093		335	609	511
v/s Ratio Prot	c0.25	0.30		0.06	c0.28		c0.12	0.13		0.06	c0.40	
v/s Ratio Perm						0.17						0.28
v/c Ratio	1.53	0.85		0.85	1.07	0.65	1.43	0.42		0.66	1.22	0.84
Uniform Delay, d1	54.5	38.9		59.6	47.8	42.4	59.5	35.4		56.5	43.8	40.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.08	0.73	0.73
Incremental Delay, d2	257.0	8.0		38.7	50.4	7.7	228.9	0.1		4.1	109.9	10.5
Delay (s)	311.5	46.9		98.3	98.2	50.1	288.4	35.5		65.1	142.0	40.1
Level of Service	F	D		F	F	D	F	D		E	F	D
Approach Delay (s)		124.5			83.7			114.1			91.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	101.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.7
Intersection Capacity Utilization	120.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	858	20	10	1476	10	60	0	10	10	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.98	
Satd. Flow (prot)	1770	3527		1770	3535			1770	1583		1695	
Flt Permitted	0.95	1.00		0.95	1.00			0.74	1.00		0.83	
Satd. Flow (perm)	1770	3527		1770	3535			1384	1583		1448	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	903	21	11	1554	11	63	0	11	11	0	11
RTOR Reduction (vph)	0	1	0	0	0	0	0	0	10	0	10	0
Lane Group Flow (vph)	11	923	0	11	1565	0	0	63	1	0	12	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		
Actuated Green, G (s)	1.2	68.6		1.2	68.6			7.2	7.2		7.2	
Effective Green, g (s)	1.2	68.6		1.2	68.6			7.2	7.2		7.2	
Actuated g/C Ratio	0.01	0.76		0.01	0.76			0.08	0.08		0.08	
Clearance Time (s)	4.0	5.0		4.0	5.0			4.0	4.0		4.0	
Vehicle Extension (s)	1.5	2.5		1.5	2.5			1.5	1.5		1.5	
Lane Grp Cap (vph)	24	2688		24	2694			111	127		116	
v/s Ratio Prot	c0.01	0.26		0.01	c0.44							
v/s Ratio Perm								c0.05	0.00		0.01	
v/c Ratio	0.46	0.34		0.46	0.58			0.57	0.01		0.10	
Uniform Delay, d1	44.1	3.4		44.1	4.6			39.9	38.1		38.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	5.0	0.3		5.0	0.9			3.9	0.0		0.1	
Delay (s)	49.1	3.8		49.1	5.5			43.8	38.1		38.5	
Level of Service	D	A		D	A			D	D		D	
Approach Delay (s)		4.3			5.8			43.0			38.5	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	6.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	50	60	632	90	120	1205
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	50	60	632	90	120	1205
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2122	677			722	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2122	677			722	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	87			86	
cM capacity (veh/h)	48	453			880	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	110	722	1325
Volume Left	50	0	120
Volume Right	60	90	0
cSH	93	1700	880
Volume to Capacity	1.18	0.42	0.14
Queue Length 95th (ft)	189	0	12
Control Delay (s)	233.8	0.0	5.0
Lane LOS	F		A
Approach Delay (s)	233.8	0.0	5.0
Approach LOS	F		

Intersection Summary			
Average Delay	15.0		
Intersection Capacity Utilization	125.2%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	304	440	80	110	1280	196	90	222	40	356	368	531
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	0.98		1.00	0.98			0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.98	1.00
Satd. Flow (prot)	1770	3458		1770	3469			1811			1818	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.99			0.98	1.00
Satd. Flow (perm)	1770	3458		1770	3469			1811			1818	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	304	440	80	110	1280	196	90	222	40	356	368	531
RTOR Reduction (vph)	0	11	0	0	9	0	0	3	0	0	0	223
Lane Group Flow (vph)	304	509	0	110	1467	0	0	349	0	0	724	308
Turn Type	Prot			Prot			Split			Split		custom
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												6
Actuated Green, G (s)	13.0	39.4		12.6	39.0			26.0			36.0	39.0
Effective Green, g (s)	13.0	39.4		12.6	39.0			26.0			36.0	39.0
Actuated g/C Ratio	0.10	0.30		0.10	0.30			0.20			0.28	0.30
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	177	1048		172	1041			362			503	475
v/s Ratio Prot	c0.17	0.15		0.06	c0.42			c0.19			c0.40	
v/s Ratio Perm												0.19
v/c Ratio	1.72	0.49		0.64	1.41			0.96			1.44	0.65
Uniform Delay, d1	58.5	37.0		56.5	45.5			51.5			47.0	39.5
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	345.6	0.4		7.6	189.9			37.5			208.8	3.0
Delay (s)	404.1	37.4		64.1	235.4			89.0			255.8	42.6
Level of Service	F	D		E	F			F			F	D
Approach Delay (s)		172.7			223.5			89.0			165.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	183.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	130.0%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	29	1208	1526	35	94	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0		5.0	5.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	3527		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	3527		1770	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	31	1272	1606	37	99	81
RTOR Reduction (vph)	0	0	1	0	0	71
Lane Group Flow (vph)	31	1272	1642	0	99	10
Turn Type	Prot					Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	2.5	42.8	35.3		7.3	7.3
Effective Green, g (s)	2.5	42.8	35.3		7.3	7.3
Actuated g/C Ratio	0.04	0.70	0.58		0.12	0.12
Clearance Time (s)	5.0	6.0	6.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	72	2479	2038		211	189
v/s Ratio Prot	0.02	c0.36	c0.47		c0.06	
v/s Ratio Perm						0.01
v/c Ratio	0.43	0.51	0.81		0.47	0.05
Uniform Delay, d1	28.6	4.3	10.2		25.1	23.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.1	0.2	2.4		1.6	0.1
Delay (s)	32.7	4.5	12.6		26.7	23.9
Level of Service	C	A	B		C	C
Approach Delay (s)		5.1	12.6		25.5	
Approach LOS		A	B		C	

Intersection Summary			
HCM Average Control Delay	10.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	61.1	Sum of lost time (s)	17.0
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	1376	1355	11	0	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1448	1426	12	0	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		306	251			
pX, platoon unblocked	0.52				0.70	0.52
vC, conflicting volume	1438				2156	719
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	98
cM capacity (veh/h)	841				714	562

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	724	724	951	487	13
Volume Left	0	0	0	0	0
Volume Right	0	0	0	12	13
cSH	1700	1700	1700	1700	562
Volume to Capacity	0.43	0.43	0.56	0.29	0.02
Queue Length 95th (ft)	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	11.5
Lane LOS					B
Approach Delay (s)	0.0		0.0		11.5
Approach LOS					B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1150	0	1936	0	0	0	0	946	350	0	630	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5		3.5					5.0			5.0	4.0
Lane Util. Factor	0.97		1.00					0.91			0.95	1.00
Frt	1.00		0.85					0.96			1.00	0.85
Flt Protected	0.95		1.00					1.00			1.00	1.00
Satd. Flow (prot)	3433		1583					4879			3539	1583
Flt Permitted	0.95		1.00					1.00			1.00	1.00
Satd. Flow (perm)	3433		1583					4879			3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1150	0	1936	0	0	0	0	946	350	0	630	110
RTOR Reduction (vph)	0	0	3	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1150	0	1933	0	0	0	0	1296	0	0	630	110
Turn Type	Prot		custom									Free
Protected Phases	4		4					2			6	
Permitted Phases												Free
Actuated Green, G (s)	96.5		96.5					25.0			25.0	130.0
Effective Green, g (s)	96.5		96.5					25.0			25.0	130.0
Actuated g/C Ratio	0.74		0.74					0.19			0.19	1.00
Clearance Time (s)	3.5		3.5					5.0			5.0	
Vehicle Extension (s)	4.0		4.0					4.0			4.0	
Lane Grp Cap (vph)	2548		1175					938			681	1583
v/s Ratio Prot	0.33		c1.22					c0.27			0.18	
v/s Ratio Perm												0.07
v/c Ratio	0.45		1.65					1.38			0.93	0.07
Uniform Delay, d1	6.5		16.8					52.5			51.6	0.0
Progression Factor	1.00		1.00					1.00			1.00	1.00
Incremental Delay, d2	0.2		294.1					178.4			18.7	0.1
Delay (s)	6.7		310.9					230.9			70.2	0.1
Level of Service	A		F					F			E	A
Approach Delay (s)		197.5			0.0			230.9			59.8	
Approach LOS		F			A			F			E	

Intersection Summary			
HCM Average Control Delay	186.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.59		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	144.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	220	240	30	328	440	516	150	500	226	1096	870	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	6.0		5.5	6.0	6.0	5.5	7.0		5.5	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	0.97	0.95		0.97	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.95		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3480		1770	3539	1583	3433	3374		3433	3393	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3480		1770	3539	1583	3433	3374		3433	3393	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	232	253	32	345	463	543	158	526	238	1154	916	347
RTOR Reduction (vph)	0	8	0	0	0	386	0	37	0	0	27	0
Lane Group Flow (vph)	232	277	0	345	463	157	158	727	0	1154	1236	0
Turn Type	Prot			Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	20.2	20.9		24.5	25.2	25.2	8.0	27.1		36.6	55.7	
Effective Green, g (s)	20.2	20.9		24.5	25.2	25.2	8.0	27.1		36.6	55.7	
Actuated g/C Ratio	0.15	0.16		0.18	0.19	0.19	0.06	0.20		0.27	0.42	
Clearance Time (s)	5.5	6.0		5.5	6.0	6.0	5.5	7.0		5.5	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	4.5		3.0	4.5	
Lane Grp Cap (vph)	269	546		326	670	300	206	687		944	1420	
v/s Ratio Prot	0.13	0.08		c0.19	c0.13		0.05	c0.22		c0.34	0.36	
v/s Ratio Perm						0.10						
v/c Ratio	0.86	0.51		1.06	0.69	0.52	0.77	1.06		1.22	0.87	
Uniform Delay, d1	55.1	51.4		54.3	50.3	48.5	61.6	53.0		48.2	35.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	23.6	0.7		66.0	3.1	1.7	15.6	50.6		109.7	6.5	
Delay (s)	78.7	52.1		120.3	53.4	50.2	77.3	103.6		157.9	41.9	
Level of Service	E	D		F	D	D	E	F		F	D	
Approach Delay (s)		64.0			69.2			99.1			97.3	
Approach LOS		E			E			F			F	

Intersection Summary			
HCM Average Control Delay	87.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	133.1	Sum of lost time (s)	24.0
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	1632	170	148	1275	100	100	0	86	60	0	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0	5.0	6.0		5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00		1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00		0.85	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3501		1770		1583	1770	1583	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95		1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	1770	3501		1770		1583	1770	1583	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	1718	179	156	1342	105	105	0	91	63	0	74
RTOR Reduction (vph)	0	0	70	0	4	0	0	0	84	0	69	0
Lane Group Flow (vph)	126	1718	109	156	1443	0	105	0	7	63	5	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2						4			
Actuated Green, G (s)	9.0	49.2	49.2	10.0	50.2		7.0		7.0	6.7	6.7	
Effective Green, g (s)	9.0	49.2	49.2	10.0	50.2		7.0		7.0	6.7	6.7	
Actuated g/C Ratio	0.10	0.52	0.52	0.11	0.53		0.07		0.07	0.07	0.07	
Clearance Time (s)	5.0	6.0	6.0	5.0	6.0		5.0		5.0	5.0	5.0	
Vehicle Extension (s)	3.0	2.0	2.0	3.0	2.0		3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	170	1854	829	188	1872		132		118	126	113	
v/s Ratio Prot	0.07	c0.49		c0.09	0.41		c0.06			0.04	0.00	
v/s Ratio Perm			0.07						c0.00			
v/c Ratio	0.74	0.93	0.13	0.83	0.77		0.80		0.06	0.50	0.05	
Uniform Delay, d1	41.3	20.7	11.4	41.1	17.3		42.7		40.4	42.0	40.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	
Incremental Delay, d2	15.9	8.4	0.0	25.0	1.8		27.3		0.2	3.1	0.2	
Delay (s)	57.2	29.1	11.5	66.2	19.1		70.0		40.6	45.1	40.8	
Level of Service	E	C	B	E	B		E		D	D	D	
Approach Delay (s)		29.3			23.7			56.3			42.8	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM Average Control Delay	28.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	93.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1658	120	58	1463	60	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0		5.0	6.0	5.0	5.0
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3503		1770	3539	1770	1583
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3503		1770	3539	1770	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1745	126	61	1540	63	38
RTOR Reduction (vph)	5	0	0	0	0	34
Lane Group Flow (vph)	1866	0	61	1540	63	4
Turn Type			Prot			Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	35.9		5.0	45.9	6.3	6.3
Effective Green, g (s)	35.9		5.0	45.9	6.3	6.3
Actuated g/C Ratio	0.57		0.08	0.73	0.10	0.10
Clearance Time (s)	6.0		5.0	6.0	5.0	5.0
Vehicle Extension (s)	4.0		3.0	4.0	3.0	3.0
Lane Grp Cap (vph)	1990		140	2570	176	158
v/s Ratio Prot	c0.53		0.03	c0.44	c0.04	
v/s Ratio Perm						0.00
v/c Ratio	0.94		0.44	0.60	0.36	0.02
Uniform Delay, d1	12.6		27.8	4.2	26.6	25.7
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	9.2		2.2	0.4	1.2	0.1
Delay (s)	21.8		29.9	4.6	27.8	25.7
Level of Service	C		C	A	C	C
Approach Delay (s)	21.8			5.6	27.0	
Approach LOS	C			A	C	

Intersection Summary			
HCM Average Control Delay	14.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	63.2	Sum of lost time (s)	17.0
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1554	120	128	1512	60	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	0.99		1.00	1.00	0.92	
Flt Protected	1.00		0.95	1.00	0.98	
Satd. Flow (prot)	3501		1770	3539	1676	
Flt Permitted	1.00		0.95	1.00	0.98	
Satd. Flow (perm)	3501		1770	3539	1676	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1636	126	135	1592	63	101
RTOR Reduction (vph)	5	0	0	0	62	0
Lane Group Flow (vph)	1757	0	135	1592	102	0
Turn Type			Prot			
Protected Phases	2		1		7	
Permitted Phases				6		
Actuated Green, G (s)	55.0		9.7	61.0	14.6	
Effective Green, g (s)	55.0		9.7	61.0	14.6	
Actuated g/C Ratio	0.58		0.10	0.65	0.15	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Vehicle Extension (s)	2.0		3.0	2.0	3.0	
Lane Grp Cap (vph)	2042		182	2289	259	
v/s Ratio Prot	c0.50		c0.08		c0.06	
v/s Ratio Perm				0.45		
v/c Ratio	0.86		0.74	0.70	0.39	
Uniform Delay, d1	16.4		41.1	10.7	35.9	
Progression Factor	1.00		1.41	0.12	1.00	
Incremental Delay, d2	3.8		10.4	0.5	1.0	
Delay (s)	20.3		68.3	1.8	36.9	
Level of Service	C		E	A	D	
Approach Delay (s)	20.3			7.0	36.9	
Approach LOS	C			A	D	

Intersection Summary			
HCM Average Control Delay	14.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	94.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	67	1584	1606	12	170	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0		5.0	5.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	3534		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	3534		1770	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	71	1667	1691	13	179	37
RTOR Reduction (vph)	0	0	0	0	0	31
Lane Group Flow (vph)	71	1667	1704	0	179	6
Confl. Peds. (#/hr)				10	20	
Confl. Bikes (#/hr)				2		
Turn Type	Prot					Perm
Protected Phases	5	2	6		3	
Permitted Phases						3
Actuated Green, G (s)	4.7	55.0	61.0		14.6	14.6
Effective Green, g (s)	4.7	55.0	61.0		14.6	14.6
Actuated g/C Ratio	0.05	0.58	0.65		0.15	0.15
Clearance Time (s)	4.0	5.0	5.0		5.0	5.0
Vehicle Extension (s)	3.0	2.0	2.0		3.0	3.0
Lane Grp Cap (vph)	88	2064	2286		274	245
v/s Ratio Prot	c0.04	c0.47	c0.48		c0.10	
v/s Ratio Perm						0.00
v/c Ratio	0.81	0.81	0.75		0.65	0.02
Uniform Delay, d1	44.4	15.5	11.4		37.5	33.8
Progression Factor	1.18	0.21	1.00		1.00	1.00
Incremental Delay, d2	23.5	1.2	1.2		5.5	0.0
Delay (s)	75.6	4.4	12.5		43.0	33.8
Level of Service	E	A	B		D	C
Approach Delay (s)		7.3	12.5		41.4	
Approach LOS		A	B		D	

Intersection Summary			
HCM Average Control Delay	11.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	94.3	Sum of lost time (s)	19.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	37	1714	1540	151	386	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.0	5.0		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	3480		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	3480		1770	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	39	1804	1621	159	406	86
RTOR Reduction (vph)	0	0	6	0	0	62
Lane Group Flow (vph)	39	1804	1774	0	406	24
Confl. Peds. (#/hr)				5	15	
Confl. Bikes (#/hr)				2		
Turn Type	Prot					Perm
Protected Phases	1	6	2		3	
Permitted Phases						3
Actuated Green, G (s)	3.9	66.8	58.4		28.8	28.8
Effective Green, g (s)	3.9	66.8	58.4		28.8	28.8
Actuated g/C Ratio	0.04	0.64	0.56		0.27	0.27
Clearance Time (s)	4.5	5.0	5.0		4.5	4.5
Vehicle Extension (s)	3.0	2.0	2.0		3.0	3.0
Lane Grp Cap (vph)	66	2249	1934		485	434
v/s Ratio Prot	0.02	c0.51	c0.51		c0.23	
v/s Ratio Perm						0.01
v/c Ratio	0.59	0.80	0.92		0.84	0.05
Uniform Delay, d1	49.8	14.2	21.2		35.9	28.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	13.4	2.0	7.2		11.9	0.1
Delay (s)	63.2	16.3	28.4		47.9	28.2
Level of Service	E	B	C		D	C
Approach Delay (s)		17.3	28.4		44.4	
Approach LOS		B	C		D	

Intersection Summary			
HCM Average Control Delay	25.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	105.1	Sum of lost time (s)	14.5
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	2003	70	160	1598	103	40	13	120	225	23	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		0.97	1.00	
Frt	1.00	0.99		1.00	0.99			0.91		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1770	3521		1770	3507			1669		3433	1667	
Flt Permitted	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (perm)	1770	3521		1770	3507			1669		3433	1667	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	2108	74	168	1682	108	42	14	126	237	24	56
RTOR Reduction (vph)	0	1	0	0	3	0	0	68	0	0	49	0
Lane Group Flow (vph)	29	2181	0	168	1787	0	0	114	0	237	31	0
Turn Type	Prot			Prot			Split			Split		
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases												
Actuated Green, G (s)	4.0	57.0		9.0	62.0			12.5		12.9	12.9	
Effective Green, g (s)	4.0	57.0		9.0	62.0			12.5		12.9	12.9	
Actuated g/C Ratio	0.04	0.53		0.08	0.57			0.12		0.12	0.12	
Clearance Time (s)	4.0	5.0		4.0	5.0			4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)	65	1851		147	2006			192		409	198	
v/s Ratio Prot	0.02	c0.62		c0.09	0.51			c0.07		c0.07	0.02	
v/s Ratio Perm												
v/c Ratio	0.45	1.18		1.14	0.89			0.59		0.58	0.15	
Uniform Delay, d1	51.1	25.7		49.7	20.3			45.5		45.2	42.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	4.8	86.1		117.8	5.4			4.8		2.0	0.4	
Delay (s)	55.9	111.8		167.5	25.7			50.4		47.2	43.2	
Level of Service	E	F		F	C			D		D	D	
Approach Delay (s)		111.1			37.9			50.4			46.2	
Approach LOS		F			D			D			D	

Intersection Summary			
HCM Average Control Delay	73.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	108.4	Sum of lost time (s)	17.0
Intersection Capacity Utilization	97.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	600	395	355	400	20	506	30	376	30	20	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.94		1.00	0.99		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3329		1770	3514		1770	1863	1583	1770	1723	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3329		1770	3514		1770	1863	1583	1770	1723	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	21	625	411	370	417	21	527	31	392	31	21	21
RTOR Reduction (vph)	0	78	0	0	3	0	0	0	279	0	20	0
Lane Group Flow (vph)	21	958	0	370	435	0	527	31	113	31	22	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.9	36.5		22.0	56.6		33.1	33.1	33.1	6.3	6.3	
Effective Green, g (s)	1.9	36.5		22.0	56.6		33.1	33.1	33.1	6.3	6.3	
Actuated g/C Ratio	0.02	0.32		0.19	0.49		0.29	0.29	0.29	0.05	0.05	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	29	1058		339	1731		510	537	456	97	94	
v/s Ratio Prot	0.01	c0.29		c0.21	0.12		c0.30	0.02		c0.02	0.01	
v/s Ratio Perm									0.07			
v/c Ratio	0.72	0.91		1.09	0.25		1.03	0.06	0.25	0.32	0.24	
Uniform Delay, d1	56.2	37.5		46.5	16.9		40.9	29.6	31.4	52.2	52.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	61.8	10.9		75.6	0.1		48.7	0.0	0.3	1.9	1.3	
Delay (s)	118.0	48.4		122.1	17.0		89.6	29.7	31.6	54.1	53.3	
Level of Service	F	D		F	B		F	C	C	D	D	
Approach Delay (s)		49.8			65.1			63.7			53.7	
Approach LOS		D			E			E			D	

Intersection Summary			
HCM Average Control Delay	58.8	HCM Level of Service	E
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	114.9	Sum of lost time (s)	17.0
Intersection Capacity Utilization	94.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	230	170	80	318	1372	870	180	920	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0		4.0	4.2		4.0	4.2	
Lane Util. Factor					0.95		0.97	0.91		1.00	0.95	
Frt					0.98		1.00	0.94		1.00	0.97	
Flt Protected					0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					3370		3433	4789		1770	3448	
Flt Permitted					0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)					3370		3433	4789		1770	3448	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	0	240	177	83	331	1429	906	188	958	198
RTOR Reduction (vph)	0	0	0	0	0	0	0	86	0	0	8	0
Lane Group Flow (vph)	0	0	0	0	500	0	331	2249	0	188	1148	0
Turn Type				Split			Prot			Prot		
Protected Phases				8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)					24.9		18.1	70.4		22.5	74.8	
Effective Green, g (s)					24.9		18.1	70.4		22.5	74.8	
Actuated g/C Ratio					0.19		0.14	0.54		0.17	0.58	
Clearance Time (s)					4.0		4.0	4.2		4.0	4.2	
Vehicle Extension (s)					3.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)					645		478	2593		306	1984	
v/s Ratio Prot					c0.15		c0.10	c0.47		c0.11	0.33	
v/s Ratio Perm												
v/c Ratio					0.78		0.69	0.96dr		0.61	0.58	
Uniform Delay, d1					49.9		53.3	25.8		49.7	17.6	
Progression Factor					1.00		0.99	0.89		1.00	1.00	
Incremental Delay, d2					5.8		3.5	3.5		3.6	1.2	
Delay (s)					55.7		56.3	26.6		53.4	18.8	
Level of Service					E		E	C		D	B	
Approach Delay (s)		0.0			55.7			30.3			23.6	
Approach LOS		A			E			C			C	

Intersection Summary			
HCM Average Control Delay	31.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.2
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	111	205	714	0	0	950	0	1219	487	190	1244	273
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.0			3.5		3.5	3.5	3.0	3.5	4.0
Lane Util. Factor		0.95	1.00			1.00		0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes		1.00	0.99			1.00		1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	0.85			0.86		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00			1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		3478	1574			1611		3539	1554	3433	3539	1535
Flt Permitted		0.98	1.00			1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		3478	1574			1611		3539	1554	3433	3539	1535
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	116	214	744	0	0	990	0	1270	507	198	1296	284
RTOR Reduction (vph)	0	0	22	0	0	18	0	0	120	0	0	0
Lane Group Flow (vph)	0	330	722	0	0	972	0	1270	387	198	1296	284
Confl. Peds. (#/hr)						2			2			11
Confl. Bikes (#/hr)			1			5			5			14
Turn Type	Split		custom			custom			custom	Prot		Free
Protected Phases	4!	4	5			2 6 4!		2 11!		1	6 11	
Permitted Phases			4						2			Free
Actuated Green, G (s)		24.0	50.0			99.5		83.8	56.8	12.7	67.0	130.0
Effective Green, g (s)		24.0	50.0			96.5		83.8	56.8	12.7	67.0	130.0
Actuated g/C Ratio		0.18	0.38			0.74		0.64	0.44	0.10	0.52	1.00
Clearance Time (s)		3.0	3.0						3.5	3.0		
Vehicle Extension (s)		3.0	3.0						5.0	3.0		
Lane Grp Cap (vph)		642	605			1196		2281	679	335	1824	1535
v/s Ratio Prot		0.09	c0.24			c0.60		0.36		0.06	c0.37	
v/s Ratio Perm			0.22						0.25			0.19
v/c Ratio		0.51	1.19			0.81		0.56	0.57	0.59	0.71	0.19
Uniform Delay, d1		47.7	40.0			10.9		12.8	27.4	56.2	24.1	0.0
Progression Factor		1.00	1.00			1.00		1.28	1.64	1.15	0.72	1.00
Incremental Delay, d2		0.7	102.9			4.3		0.2	2.7	2.6	1.3	0.3
Delay (s)		48.4	142.9			15.2		16.6	47.7	67.2	18.6	0.3
Level of Service		D	F			B		B	D	E	B	A
Approach Delay (s)		113.9			15.2			25.5			21.1	
Approach LOS		F			B			C			C	

Intersection Summary			
HCM Average Control Delay	39.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	111.6%	ICU Level of Service	H
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	280	5	140	10	5	50	60	1376	20	80	1697	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1	5.1		5.1		5.1	5.1		5.1	5.1	
Lane Util. Factor	0.95	0.95	1.00		1.00		1.00	0.95		1.00	0.91	
Frt	1.00	1.00	0.85		0.90		1.00	1.00		1.00	0.99	
Flt Protected	0.95	0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1688	1583		1656		1770	3532		1770	5012	
Flt Permitted	0.95	0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1688	1583		1656		1770	3532		1770	5012	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	295	5	147	11	5	53	63	1448	21	84	1786	189
RTOR Reduction (vph)	0	0	128	0	51	0	0	1	0	0	8	0
Lane Group Flow (vph)	150	150	19	0	18	0	63	1468	0	84	1967	0
Turn Type	Split		Perm	Split			Prot			Prot		
Protected Phases	4	4		3	3		1	6		5	2	
Permitted Phases			4									
Actuated Green, G (s)	16.7	16.7	16.7		5.3		7.5	77.7		9.9	80.1	
Effective Green, g (s)	16.7	16.7	16.7		5.3		7.5	77.7		9.9	80.1	
Actuated g/C Ratio	0.13	0.13	0.13		0.04		0.06	0.60		0.08	0.62	
Clearance Time (s)	5.1	5.1	5.1		5.1		5.1	5.1		5.1	5.1	
Vehicle Extension (s)	1.7	1.7	1.7		1.7		1.7	2.2		1.7	2.2	
Lane Grp Cap (vph)	216	217	203		68		102	2111		135	3088	
v/s Ratio Prot	c0.09	0.09			c0.01		0.04	c0.42		0.05	c0.39	
v/s Ratio Perm			0.01									
v/c Ratio	0.69	0.69	0.09		0.27		0.62	0.70		0.62	0.64	
Uniform Delay, d1	54.2	54.2	50.0		60.5		59.8	18.0		58.2	15.8	
Progression Factor	1.00	1.00	1.00		1.00		0.74	1.46		0.95	0.88	
Incremental Delay, d2	7.6	7.4	0.1		0.8		0.7	0.2		2.9	0.5	
Delay (s)	61.8	61.6	50.0		61.2		44.9	26.4		58.0	14.4	
Level of Service	E	E	D		E		D	C		E	B	
Approach Delay (s)		57.9			61.2			27.1			16.2	
Approach LOS		E			E			C			B	

Intersection Summary			
HCM Average Control Delay	25.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	70.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	656	1447	244	60	772	470	392	330	100	800	350	697
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3446		1770	3539	1557	1770	3403		3433	1863	1562
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3446		1770	3539	1557	1770	3403		3433	1863	1562
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	656	1447	244	60	772	470	392	330	100	800	350	697
RTOR Reduction (vph)	0	10	0	0	0	269	0	22	0	0	0	277
Lane Group Flow (vph)	656	1681	0	60	772	201	392	408	0	800	350	420
Confl. Peds. (#/hr)			6			1			3			1
Confl. Bikes (#/hr)						3						
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	27.8	50.5		5.0	27.7	27.7	24.5	25.0		28.3	28.8	28.8
Effective Green, g (s)	27.8	50.5		5.0	27.7	27.7	24.5	25.0		28.3	28.8	28.8
Actuated g/C Ratio	0.21	0.39		0.04	0.21	0.21	0.19	0.19		0.22	0.22	0.22
Clearance Time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Vehicle Extension (s)	3.0	2.2		3.0	2.2	2.2	3.0	2.2		3.0	2.2	2.2
Lane Grp Cap (vph)	379	1339		68	754	332	334	654		747	413	346
v/s Ratio Prot	c0.37	c0.49		0.03	0.22		0.22	0.12		c0.23	0.19	
v/s Ratio Perm						0.13						c0.27
v/c Ratio	1.73	1.26		0.88	1.02	0.61	1.17	0.62		1.07	0.85	1.21
Uniform Delay, d1	51.1	39.8		62.2	51.1	46.2	52.8	48.2		50.9	48.5	50.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.03	0.80	0.91
Incremental Delay, d2	339.8	121.1		69.4	39.0	2.3	105.2	1.5		50.5	15.8	115.8
Delay (s)	390.9	160.8		131.6	90.1	48.5	157.9	49.6		102.6	54.7	161.8
Level of Service	F	F		F	F	D	F	D		F	D	F
Approach Delay (s)		225.1			77.0			101.3			115.9	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM Average Control Delay	146.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.7
Intersection Capacity Utilization	117.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	2197	40	10	1202	10	20	0	10	10	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00			1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.98	
Satd. Flow (prot)	1770	3530		1770	3535			1770	1583		1695	
Flt Permitted	0.95	1.00		0.95	1.00			0.98	1.00		0.83	
Satd. Flow (perm)	1770	3530		1770	3535			1817	1583		1444	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	2313	42	11	1265	11	21	0	11	11	0	11
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	11	0	11	0
Lane Group Flow (vph)	11	2355	0	11	1276	0	0	21	0	0	11	0
Turn Type	Prot			Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			4			8	
Permitted Phases							4		4	8		
Actuated Green, G (s)	1.2	91.7		1.2	91.7			4.1	4.1		4.1	
Effective Green, g (s)	1.2	91.7		1.2	91.7			4.1	4.1		4.1	
Actuated g/C Ratio	0.01	0.83		0.01	0.83			0.04	0.04		0.04	
Clearance Time (s)	4.0	5.0		4.0	5.0			4.0	4.0		4.0	
Vehicle Extension (s)	1.5	2.5		1.5	2.5			1.5	1.5		1.5	
Lane Grp Cap (vph)	19	2943		19	2947			68	59		54	
v/s Ratio Prot	c0.01	c0.67		0.01	0.36							
v/s Ratio Perm								c0.01	0.00		0.01	
v/c Ratio	0.58	0.80		0.58	0.43			0.31	0.01		0.21	
Uniform Delay, d1	54.1	4.6		54.1	2.4			51.6	51.0		51.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	23.8	2.4		23.8	0.5			0.9	0.0		0.7	
Delay (s)	78.0	7.0		78.0	2.8			52.5	51.0		52.1	
Level of Service	E	A		E	A			D	D		D	
Approach Delay (s)		7.3			3.5			52.0			52.1	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	6.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	20	70	872	50	50	574
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	74	918	53	53	604
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1654	944			971	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1654	944			971	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	79	77			93	
cM capacity (veh/h)	100	318			710	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	95	971	657
Volume Left	21	0	53
Volume Right	74	53	0
cSH	214	1700	710
Volume to Capacity	0.44	0.57	0.07
Queue Length 95th (ft)	52	0	6
Control Delay (s)	34.5	0.0	1.9
Lane LOS	D		A
Approach Delay (s)	34.5	0.0	1.9
Approach LOS	D		

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	83.7%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	262	1050	120	50	500	258	100	401	80	141	325	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00			1.00	1.00
Frt	1.00	0.98		1.00	0.95			0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	1.00
Satd. Flow (prot)	1770	3485		1770	3359			1813			1835	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.99			0.99	1.00
Satd. Flow (perm)	1770	3485		1770	3359			1813			1835	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	262	1050	120	50	500	258	100	401	80	141	325	128
RTOR Reduction (vph)	0	7	0	0	51	0	0	4	0	0	0	84
Lane Group Flow (vph)	262	1163	0	50	707	0	0	577	0	0	466	44
Turn Type	Prot			Prot			Split			Split		custom
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												6
Actuated Green, G (s)	18.0	44.0		4.0	30.0			37.0			29.0	30.0
Effective Green, g (s)	18.0	44.0		4.0	30.0			37.0			29.0	30.0
Actuated g/C Ratio	0.14	0.34		0.03	0.23			0.28			0.22	0.23
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	3.0
Lane Grp Cap (vph)	245	1180		54	775			516			409	365
v/s Ratio Prot	c0.15	c0.33		0.03	0.21			c0.32			c0.25	
v/s Ratio Perm												0.03
v/c Ratio	1.07	0.99		0.93	0.91			1.12			1.14	0.12
Uniform Delay, d1	56.0	42.7		62.9	48.7			46.5			50.5	39.6
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	77.1	22.6		94.6	15.0			76.0			88.3	0.1
Delay (s)	133.1	65.3		157.5	63.7			122.5			138.8	39.7
Level of Service	F	E		F	E			F			F	D
Approach Delay (s)		77.7			69.5			122.5			117.4	
Approach LOS		E			E			F			F	

Intersection Summary			
HCM Average Control Delay	90.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	106.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	87	1607	1466	106	67	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	6.0		5.0	5.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	3539	3503		1770	1583
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	3539	3503		1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	95	1747	1593	115	73	60
RTOR Reduction (vph)	0	0	4	0	0	53
Lane Group Flow (vph)	95	1747	1704	0	73	7
Turn Type	Prot					Perm
Protected Phases	7	4	8		6	
Permitted Phases						6
Actuated Green, G (s)	7.1	42.4	30.3		6.6	6.6
Effective Green, g (s)	7.1	42.4	30.3		6.6	6.6
Actuated g/C Ratio	0.12	0.71	0.51		0.11	0.11
Clearance Time (s)	5.0	6.0	6.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	209	2501	1769		195	174
v/s Ratio Prot	0.05	c0.49	c0.49		c0.04	
v/s Ratio Perm						0.00
v/c Ratio	0.45	0.70	0.96		0.37	0.04
Uniform Delay, d1	24.6	5.1	14.3		24.8	23.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.6	0.9	13.6		1.2	0.1
Delay (s)	26.2	6.0	27.9		26.0	24.0
Level of Service	C	A	C		C	C
Approach Delay (s)		7.0	27.9		25.1	
Approach LOS		A	C		C	

Intersection Summary			
HCM Average Control Delay	17.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	1751	1603	19	0	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1903	1742	21	0	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		296	261			
pX, platoon unblocked	0.53				0.72	0.53
vC, conflicting volume	1763				2704	882
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	646				125	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	97
cM capacity (veh/h)	491				620	570

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	952	952	1162	601	16
Volume Left	0	0	0	0	0
Volume Right	0	0	0	21	16
cSH	1700	1700	1700	1700	570
Volume to Capacity	0.56	0.56	0.68	0.35	0.03
Queue Length 95th (ft)	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	11.5
Lane LOS					B
Approach Delay (s)	0.0		0.0		11.5
Approach LOS					B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

Pittsburg/Baypoint BART
Cumulative With Project
AM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #1 Willow Pass Rd./SR 4 EB Ramps

Cycle (sec):	180	Critical Vol./Cap.(X):	0.838
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	140	Level Of Service:	D

Street Name:	Willow Pass Rd.						SR 4 EB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Ignore			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0 0	2	1 0	0 0	2	0 1	2 0	0	0 1	0 0	0	0 0
Volume Module:												
Base Vol:	0	1990	280	0	470	280	380	0	400	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1990	280	0	470	280	380	0	400	0	0	0
Added Vol:	0	111	0	0	0	0	0	0	74	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	2101	280	0	470	280	380	0	474	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
PHF Volume:	0	2388	318	0	534	318	432	0	539	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	2388	318	0	534	318	432	0	539	0	0	0
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Vol:	0	2388	318	0	534	318	432	0	539	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	2388	318	0	534	318	432	0	539	0	0	0
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	2.65	0.35	0.00	2.00	1.00	2.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	0	4553	607	0	3440	1720	3127	0	1720	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.52	0.52	0.00	0.16	0.18	0.14	0.00	0.31	0.00	0.00	0.00
Crit Volume:		902		0					539		0	
Crit Moves:		****		****					****			

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                        Pittsburg/Baypoint BART
                        Cumulative With Project
                             AM Peak Hour
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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #2 San Marco Blvd./W Leland Rd.
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):        1.098
Loss Time (sec):       0                Average Delay (sec/veh):     xxxxxx
Optimal Cycle:       180                Level Of Service:                 F
********************************************************************************
Street Name:         San Marco Blvd.                    W Leland Rd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        2  0  1  1  0    2  0  1  1  0    1  0  1  1  0    1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      60  910   350  300  510    50  210  340   140  330  110  1050
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   60  910   350  300  510    50  210  340   140  330  110  1050
Added Vol:      0    0     1   74    0     0    0    0     0    1    0   111
RTOR Adjust:    0    0     0    0    0     0    0    0     0    0    0  -280
Initial Fut:   60  910   351  374  510    50  210  340   140  331  110   881
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:    63  958   369  394  537    53  221  358   147  348  116   927
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   63  958   369  394  537    53  221  358   147  348  116   927
RTOR Reduct:    0    0     0    0    0     0    0    0     0    0    0   217
RTOR Vol:      63  958   369  394  537    53  221  358   147  348  116   711
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   63  958   369  394  537    53  221  358   147  348  116   711
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:  0.91 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       2.00 1.44  0.56 2.00 1.82  0.18 1.00 1.42  0.58 1.00 2.00  1.00
Final Sat.:  3000 2381   919 3000 3005   295 1650 2338   962 1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.40  0.40 0.13 0.18  0.18 0.13 0.15  0.15 0.21 0.04  0.43
Crit Volume:             664  197              221                          711
Crit Moves:             ****  ****             ****                        ****
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                            Pittsburg/Baypoint BART
                            Cumulative With Project
                                 AM Peak Hour
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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Alves Ranch Rd./W Leland Rd.
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):        0.750
Loss Time (sec):        0                Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         91                Level Of Service:                 C
********************************************************************************
Street Name:          Alves Ranch Rd.                      W Leland Rd.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        1  0  1  0  1   1  0  0  1  0   1  0  2  0  1   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     200    0   210  100    0   120   40  860   190  120 1520     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse: 200    0   210  100    0   120   40  860   190  120 1520     0
Added Vol:     0    0     1    0    0     0    0   75     0    1  112     0
PasserByVol:   0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut: 200    0   211  100    0   120   40  935   190  121 1632     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:   211    0   222  105    0   126   42  984   200  127 1718     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  211    0   222  105    0   126   42  984   200  127 1718     0
RTOR Reduct:    0    0   127    0    0     0    0    0   200    0    0     0
RTOR Vol:     211    0    95  105    0   126   42  984     0  127 1718     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  211    0    95  105    0   126   42  984     0  127 1718     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       1.00 1.00  1.00 1.00 0.00  1.00 1.00 2.00  1.00 1.00 2.00  0.00
Final Sat.:  1650 1650  1650 1650    0  1650 1650 3300  1650 1650 3300     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.13 0.00  0.06 0.06 0.00  0.08 0.03 0.30  0.00 0.08 0.52  0.00
Crit Volume:  211                        126   42                  859
Crit Moves:  ****                       **** ****                 ****
********************************************************************************
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Pittsburg/Baypoint BART
Cumulative With Project
AM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #4 Woodhill Dr./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.702
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	77	Level Of Service:	C

Street Name:	Woodhill Dr.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	0	0 1	0 0	0	0 0	0 0	1	1 0	1 0	2	0 0
Volume Module:												
Base Vol:	180	0	60	0	0	0	0	1100	70	30	1460	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	180	0	60	0	0	0	0	1100	70	30	1460	0
Added Vol:	0	0	1	0	0	0	0	76	0	1	113	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	180	0	61	0	0	0	0	1176	70	31	1573	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
PHF Volume:	225	0	76	0	0	0	0	1470	88	39	1966	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	225	0	76	0	0	0	0	1470	88	39	1966	0
RTOR Reduct:	0	0	39	0	0	0	0	0	0	0	0	0
RTOR Vol:	225	0	38	0	0	0	0	1470	88	39	1966	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	225	0	38	0	0	0	0	1470	88	39	1966	0
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.89	0.11	1.00	2.00	0.00
Final Sat.:	1720	0	1720	0	0	0	0	3247	193	1720	3440	0
Capacity Analysis Module:												
Vol/Sat:	0.13	0.00	0.02	0.00	0.00	0.00	0.00	0.45	0.45	0.02	0.57	0.00
Crit Volume:	225				0		0				983	
Crit Moves:	****						****				****	

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                           Pittsburg/Baypoint BART
                           Cumulative With Project
                                AM Peak Hour
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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #5 Southwood Dr./W Leland Rd.
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):        0.727
Loss Time (sec):       0               Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        68               Level Of Service:                 C
********************************************************************************
Street Name:              Southwood Dr.                      W Leland Rd.
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted        Permitted        Protected         Protected
Rights:           Include          Include          Include           Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  1! 0  0   0  0  0  0  0   0  0  1  1  0   1  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     190    0   140    0    0     0    0 1100    60   30 1300     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse: 190    0   140    0    0     0    0 1100    60   30 1300     0
Added Vol:     0    0     1    0    0     0    0  142     0    1   72     0
PasserByVol:   0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut: 190    0   141    0    0     0    0 1242    60   31 1372     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.81 0.81  0.81 0.81 0.81  0.81 0.81 0.81  0.81 0.81 0.81  0.81
PHF Volume:   235    0   174    0    0     0    0 1533    74   38 1694     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol: 235    0   174    0    0     0    0 1533    74   38 1694     0
RTOR Reduct:   0    0     0    0    0     0    0    0     0    0    0     0
RTOR Vol:     235    0   174    0    0     0    0 1533    74   38 1694     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume: 235    0   174    0    0     0    0 1533    74   38 1694     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.57 0.00  0.43 0.00 0.00  0.00 0.00 1.91  0.09 1.00 2.00  0.00
Final Sat.:   987    0   733    0    0     0    0 3281   159 1720 3440     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.24 0.00  0.24 0.00 0.00  0.00 0.00 0.47  0.47 0.02 0.49  0.00
Crit Volume:             409    0                    804         38
Crit Moves:             ****                        ****        ****
********************************************************************************
```

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--------------------------------------------------------------------------------
                          Pittsburg/Baypoint BART
                          Cumulative With Project
                               AM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #6 West Bart Driveway/W Leland Rd.
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):        0.522
Loss Time (sec):       0               Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        39               Level Of Service:                 A
********************************************************************************
Street Name:        West Bart Driveway                  W Leland Rd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  0  0  0   1  0  0  0  1   1  0  2  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0     0   50    0    40    0 1240     0    0 1290     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0    0     0   50    0    40    0 1240     0    0 1290     0
Added Vol:      0    0     0  -27    0     6   30  113     0    0   67    10
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    0    0     0   23    0    46   30 1353     0    0 1357    10
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.82 0.82  0.82 0.82 0.82  0.82 0.82 0.82  0.82 0.82 0.82  0.82
PHF Volume:     0    0     0   28    0    56   37 1650     0    0 1655    12
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0     0   28    0    56   37 1650     0    0 1655    12
RTOR Reduct:    0    0     0    0    0    37    0    0     0    0    0     0
RTOR Vol:       0    0     0   28    0    20   37 1650     0    0 1655    12
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    0    0     0   28    0    20   37 1650     0    0 1655    12
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 0.00  0.00 1.00 0.00  1.00 1.00 2.00  0.00 0.00 1.99  0.01
Final Sat.:     0    0     0 1720    0  1720 1720 3440     0    0 3415    25
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.02 0.00  0.01 0.02 0.48  0.00 0.00 0.48  0.48
Crit Volume:         0          28               37                   834
Crit Moves:                   ****             ****                  ****
********************************************************************************
```

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--------------------------------------------------------------------------------
                            Pittsburg/Baypoint BART
                            Cumulative With Project
                                 AM Peak Hour
--------------------------------------------------------------------------------

                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #7 East Bart Driveway/W Leland Rd.
********************************************************************************
Cycle (sec):           100                Critical Vol./Cap.(X):         0.656
Loss Time (sec):         0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:          66                Level Of Service:                  B
********************************************************************************
Street Name:          East Bart Driveway                  W Leland Rd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  0  0  0   1  0  0  0  1   1  0  2  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0     0    0    0     0   60 1230     0    0 1290   190
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0    0     0    0    0     0   60 1230     0    0 1290   190
Added Vol:      0    0     0   47    0    10  -10   96     0    0   66   178
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    0    0     0   47    0    10   50 1326     0    0 1356   368
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.85 0.85  0.85 0.85 0.85  0.85 0.85 0.85  0.85 0.85 0.85  0.85
PHF Volume:     0    0     0   55    0    12   59 1560     0    0 1595   433
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0     0   55    0    12   59 1560     0    0 1595   433
RTOR Reduct:    0    0     0    0    0    12    0    0     0    0    0     0
RTOR Vol:       0    0     0   55    0     0   59 1560     0    0 1595   433
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    0    0     0   55    0     0   59 1560     0    0 1595   433
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 0.00  0.00 1.00 0.00  1.00 1.00 2.00  0.00 0.00 1.57  0.43
Final Sat.:     0    0     0 1720    0  1720 1720 3440     0    0 2706   734
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.03 0.00  0.00 0.03 0.45  0.00 0.00 0.59  0.59
Crit Volume:         0          55               59                    1014
Crit Moves:                   ****             ****                    ****
********************************************************************************
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Pittsburg/Baypoint BART
Cumulative With Project
AM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #8 Oak Hill Dr./W Leland Rd.

Cycle (sec):	90	Critical Vol./Cap.(X):	0.707
Loss Time (sec):	16	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	97	Level Of Service:	C

Street Name:	Oak Hill Dr.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Split Phase			Split Phase			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0 0	1!	0 0	2 0	0	1 0	1 0	1	1 0	1 0	1	1 0
Volume Module:												
Base Vol:	70	0	160	0	0	0	0	1190	40	80	1410	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	70	0	160	0	0	0	0	1190	40	80	1410	0
Added Vol:	0	12	0	25	2	9	28	115	0	0	234	120
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	70	12	160	25	2	9	28	1305	40	80	1644	120
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	70	12	160	25	2	9	28	1305	40	80	1644	120
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	70	12	160	25	2	9	28	1305	40	80	1644	120
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Vol:	70	12	160	25	2	9	28	1305	40	80	1644	120
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	70	12	160	25	2	9	28	1305	40	80	1644	120
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.29	0.05	0.66	2.00	0.18	0.82	1.00	1.94	0.06	1.00	1.86	0.14
Final Sat.:	477	82	1091	3000	300	1350	1650	3202	98	1650	3076	224
Capacity Analysis Module:												
Vol/Sat:	0.15	0.15	0.15	0.01	0.01	0.01	0.02	0.41	0.41	0.05	0.53	0.53
Crit Volume:		242		13			28				882	
Crit Moves:		****		****			****				****	

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                          Pittsburg/Baypoint BART
                          Cumulative With Project
                               AM Peak Hour
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                    Level Of Service Computation Report
                CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #9 Bailey Rd./Willow Pass Rd.
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         1.021
Loss Time (sec):        0               Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        180               Level Of Service:                  F
********************************************************************************
Street Name:                Bailey Rd.                     Willow Pass Rd.
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Split Phase      Split Phase       Protected         Protected
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        1  0  1  0  1   1  0  0  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     750   10   380   10   10    10   10  270   400  330 1040    20
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  750   10   380   10   10    10   10  270   400  330 1040    20
Added Vol:     19    0    19    0    0     0    0    0    52   29    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  769   10   399   10   10    10   10  270   452  359 1040    20
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:   809   11   420   11   11    11   11  284   476  378 1095    21
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  809   11   420   11   11    11   11  284   476  378 1095    21
RTOR Reduct:    0    0   378    0    0     0    0    0     0    0    0     0
RTOR Vol:     809   11    42   11   11    11   11  284   476  378 1095    21
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  809   11    42   11   11    11   11  284   476  378 1095    21
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       1.00 1.00  1.00 1.00 0.50  0.50 1.00 1.00  1.00 1.00 1.96  0.04
Final Sat.:  1650 1650  1650 1650  825   825 1650 1650  1650 1650 3238    62
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.49 0.01  0.03 0.01 0.01  0.01 0.01 0.17  0.29 0.23 0.34  0.34
Crit Volume:  809                 21                       476  378
Crit Moves:  ****               ****                      **** ****
********************************************************************************
```

Pittsburg/Baypoint BART
Cumulative With Project
AM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #10 Bailey Rd./SR 4 WB Ramps-Canal Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.835
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	138	Level Of Service:	D

Street Name:	Bailey Rd.						SR 4 WB Ramps-Canal Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	2 0	2	1 0	1 0	1	1 0	0 0	0	0 0	0 1	0	1 0
Volume Module:												
Base Vol:	530	910	230	160	860	280	0	0	0	290	360	330
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	530	910	230	160	860	280	0	0	0	290	360	330
Added Vol:	29	37	0	0	81	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	559	947	230	160	941	280	0	0	0	290	360	330
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
PHF Volume:	570	966	235	163	960	286	0	0	0	296	367	337
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	570	966	235	163	960	286	0	0	0	296	367	337
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Vol:	570	966	235	163	960	286	0	0	0	296	367	337
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	570	966	235	163	960	286	0	0	0	296	367	337
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.41	0.59	1.00	1.54	0.46	0.00	0.00	0.00	0.59	0.74	0.67
Final Sat.:	3127	4152	1008	1720	2651	789	0	0	0	1018	1264	1158
Capacity Analysis Module:												
Vol/Sat:	0.18	0.23	0.23	0.09	0.36	0.36	0.00	0.00	0.00	0.29	0.29	0.29
Crit Volume:	285				623			0				500
Crit Moves:	****				****							****

Pittsburg/Baypoint BART
Cumulative With Project
AM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #11 Bailey Rd./SR 4 EB Ramps-Bart

Cycle (sec):	100	Critical Vol./Cap.(X):	0.616
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	59	Level Of Service:	B

Street Name:	Bailey Rd.						SR 4 EB Ramps-Bart					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Ignore			Ovl			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0 0	2 0	1	2 0	2 0	1	0 1	1 0	1	0 0	0 0	1
Volume Module:												
Base Vol:	0	1100	320	180	1160	450	70	110	210	0	0	250
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1100	320	180	1160	450	70	110	210	0	0	250
Added Vol:	0	47	20	0	242	-173	20	29	54	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	1147	340	180	1402	277	90	139	264	0	0	250
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	0	1207	358	189	1476	292	95	146	278	0	0	263
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1207	358	189	1476	292	95	146	278	0	0	263
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Vol:	0	1207	358	189	1476	292	95	146	278	0	0	263
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	1207	358	189	1476	292	95	146	278	0	0	263
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	2.00	1.00	2.00	2.00	1.00	0.79	1.21	1.00	0.00	0.00	1.00
Final Sat.:	0	3300	1650	3000	3300	1650	1297	2003	1650	0	0	1650
Capacity Analysis Module:												
Vol/Sat:	0.00	0.37	0.22	0.06	0.45	0.18	0.07	0.07	0.17	0.00	0.00	0.16
Crit Volume:	0				738				278		0	
Crit Moves:	****				****				****		****	

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                            Pittsburg/Baypoint BART
                            Cumulative With Project
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #12 Bailey Rd./Maylard St.
********************************************************************************
Cycle (sec):        100               Critical Vol./Cap.(X):        0.565
Loss Time (sec):      0               Average Delay (sec/veh):     xxxxxx
Optimal Cycle:       52               Level Of Service:                 A
********************************************************************************
Street Name:              Bailey Rd.                       Maylard St.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        1  0  1  1  0   1  0  2  1  0   1  1  0  0  1   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      30 1220    30   30 1230   110  130    5    40   20    5    70
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   30 1220    30   30 1230   110  130    5    40   20    5    70
Added Vol:      0   67     0    0  296     0    0    0     0    0    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:   30 1287    30   30 1526   110  130    5    40   20    5    70
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92
PHF Volume:    33 1399    33   33 1659   120  141    5    43   22    5    76
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   33 1399    33   33 1659   120  141    5    43   22    5    76
RTOR Reduct:    0    0     0    0    0     0    0    0    33    0    0     0
RTOR Vol:      33 1399    33   33 1659   120  141    5    11   22    5    76
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   33 1399    33   33 1659   120  141    5    11   22    5    76
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00
Lanes:       1.00 1.95  0.05 1.00 2.80  0.20 1.93 0.07  1.00 0.21 0.05  0.74
Final Sat.:  1650 3225    75 1650 4617   333 2889  122  1650  347   87  1216
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.43  0.43 0.02 0.36  0.36 0.05 0.04  0.01 0.06 0.06  0.06
Crit Volume:             716   33              73                   103
Crit Moves:             ****  ****            ****                 ****
********************************************************************************
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--------------------------------------------------------------------------------
                         Pittsburg/Baypoint BART
                         Cumulative With Project
                              AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
                   CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #13 Bailey Rd./W Leland Rd.
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):        1.147
Loss Time (sec):       0               Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       180               Level Of Service:                  F
********************************************************************************
Street Name:                Bailey Rd.                       W Leland Rd.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        1  0  1  1  0   2  0  1  0  1   1  0  1  1  0   1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     180  430    40   220  740   330   370  660   320   110  980   480
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  180  430    40   220  740   330   370  660   320   110  980   480
Added Vol:     32    0     0     0    0   296    67   18    55     0   26     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  212  430    40   220  740   626   437  678   375   110 1006   480
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   212  430    40   220  740   626   437  678   375   110 1006   480
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  212  430    40   220  740   626   437  678   375   110 1006   480
RTOR Reduct:    0    0     0     0    0   437     0    0     0     0    0   121
RTOR Vol:     212  430    40   220  740   189   437  678   375   110 1006   359
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  212  430    40   220  740   189   437  678   375   110 1006   359
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.83  0.17  2.00 1.00  1.00  1.00 1.29  0.71  1.00 2.00  1.00
Final Sat.:  1650 3019   281  3000 1650  1650  1650 2125  1175  1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.13 0.14  0.14  0.07 0.45  0.11  0.26 0.32  0.32  0.07 0.30  0.22
Crit Volume:  212                   740         437                     503
Crit Moves:  ****                  ****        ****                    ****
********************************************************************************
```

Pittsburg/Baypoint BART
Cumulative With Project
AM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #14 Chestnut Dr./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.557
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	42	Level Of Service:	A

Street Name:	Chestnut Dr.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0 1	0	0 1	0 0	1!	0 0	1 0	1	1 0	1 0	1	1 0
Volume Module:												
Base Vol:	60	0	10	10	0	10	10	840	20	10	1450	10
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	60	0	10	10	0	10	10	840	20	10	1450	10
Added Vol:	0	0	0	0	0	0	0	18	0	0	26	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	60	0	10	10	0	10	10	858	20	10	1476	10
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
PHF Volume:	69	0	11	11	0	11	11	986	23	11	1697	11
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	69	0	11	11	0	11	11	986	23	11	1697	11
RTOR Reduct:	0	0	11	0	0	0	0	0	0	0	0	0
RTOR Vol:	69	0	0	11	0	11	11	986	23	11	1697	11
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	69	0	0	11	0	11	11	986	23	11	1697	11
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.00	1.00	0.50	0.00	0.50	1.00	1.95	0.05	1.00	1.99	0.01
Final Sat.:	1720	0	1720	860	0	860	1720	3362	78	1720	3417	23
Capacity Analysis Module:												
Vol/Sat:	0.04	0.00	0.00	0.01	0.00	0.01	0.01	0.29	0.29	0.01	0.50	0.50
Crit Volume:	69					23	11				854	
Crit Moves:	****					****	****				****	

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--------------------------------------------------------------------------------
                         Pittsburg/Baypoint BART
                         Cumulative With Project
                              AM Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #16 Bailey Rd./Concord Blvd.
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):        1.284
Loss Time (sec):       0               Average Delay (sec/veh):     xxxxxx
Optimal Cycle:       180               Level Of Service:                 F
********************************************************************************
Street Name:              Bailey Rd.                      Concord Blvd.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  1! 0  0   0  1  0  0  1   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      90  200    40  340  340   520  300  440    80  110 1280   190
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   90  200    40  340  340   520  300  440    80  110 1280   190
Added Vol:      0   22     0   16   28    11    4    0     0    0    0     6
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:   90  222    40  356  368   531  304  440    80  110 1280   196
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:    90  222    40  356  368   531  304  440    80  110 1280   196
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   90  222    40  356  368   531  304  440    80  110 1280   196
RTOR Reduct:    0    0     0    0    0   304    0    0     0    0    0     0
RTOR Vol:      90  222    40  356  368   227  304  440    80  110 1280   196
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   90  222    40  356  368   227  304  440    80  110 1280   196
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.26 0.63  0.11 0.49 0.51  1.00 1.00 1.69  0.31 1.00 1.73  0.27
Final Sat.:   422 1041   188  811  839  1650 1650 2792   508 1650 2862   438
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.21 0.21  0.21 0.44 0.44  0.14 0.18 0.16  0.16 0.07 0.45  0.45
Crit Volume:       352             724        304                         738
Crit Moves:       ****            ****       ****                        ****
********************************************************************************
```

Pittsburg/Baypoint BART
Cumulative With Project
PM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #1 Willow Pass Rd./SR 4 EB Ramps

Cycle (sec):	180	Critical Vol./Cap.(X):	1.377
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	180	Level Of Service:	F

Street Name:	Willow Pass Rd.						SR 4 EB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Ignore			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0 0	2	1 0	0 0	2	0 1	2 0	0	0 1	0 0	0	0 0
Volume Module:												
Base Vol:	0	820	350	0	630	110	1150	0	1780	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	820	350	0	630	110	1150	0	1780	0	0	0
Added Vol:	0	126	0	0	0	0	0	0	156	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	946	350	0	630	110	1150	0	1936	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	0	946	350	0	630	110	1150	0	1936	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	946	350	0	630	110	1150	0	1936	0	0	0
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Vol:	0	946	350	0	630	110	1150	0	1936	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	946	350	0	630	110	1150	0	1936	0	0	0
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	2.19	0.81	0.00	2.00	1.00	2.00	0.00	1.00	0.00	0.00	0.00
Final Sat.:	0	3766	1394	0	3440	1720	3127	0	1720	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.25	0.25	0.00	0.18	0.06	0.37	0.00	1.13	0.00	0.00	0.00
Crit Volume:		432		0					1936		0	
Crit Moves:		****		****					****			

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                            Pittsburg/Baypoint BART
                            Cumulative With Project
                                 PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #2 San Marco Blvd./W Leland Rd.
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.912
Loss Time (sec):        0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        180                Level Of Service:                  E
********************************************************************************
Street Name:          San Marco Blvd.                     W Leland Rd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        2  0  1  1  0    2  0  1  1  0    1  0  1  1  0    1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     150  500   220   940  870   330   220  240    30   320  440   390
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  150  500   220   940  870   330   220  240    30   320  440   390
Added Vol:      0    0     6   156    0     0     0    0     0     8    0   126
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  150  500   226  1096  870   330   220  240    30   328  440   516
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:   158  526   238  1154  916   347   232  253    32   345  463   543
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  158  526   238  1154  916   347   232  253    32   345  463   543
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0   543
RTOR Vol:     158  526   238  1154  916   347   232  253    32   345  463     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  158  526   238  1154  916   347   232  253    32   345  463     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  0.91 1.00  1.00  0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       2.00 1.38  0.62  2.00 1.45  0.55  1.00 1.78  0.22  1.00 2.00  1.00
Final Sat.:  3000 2273  1027  3000 2393   908  1650 2933   367  1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.05 0.23  0.23  0.38 0.38  0.38  0.14 0.09  0.09  0.21 0.14  0.00
Crit Volume:       382         577                             142   345
Crit Moves:       ****        ****                            ****  ****
********************************************************************************
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Pittsburg/Baypoint BART
Cumulative With Project
PM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #3 Alves Ranch Rd./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.747
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	90	Level Of Service:	C

Street Name:	Alves Ranch Rd.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	1 0	1	1 0	0 1	0	1 0	2 0	1	1 0	1 1	0
Volume Module:												
Base Vol:	100	0	80	60	0	70	120	1470	170	140	1140	100
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	100	0	80	60	0	70	120	1470	170	140	1140	100
Added Vol:	0	0	6	0	0	0	0	162	0	8	135	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	100	0	86	60	0	70	120	1632	170	148	1275	100
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	109	0	93	65	0	76	130	1774	185	161	1386	109
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	109	0	93	65	0	76	130	1774	185	161	1386	109
RTOR Reduct:	0	0	93	0	0	0	0	0	109	0	0	0
RTOR Vol:	109	0	0	65	0	76	130	1774	76	161	1386	109
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	109	0	0	65	0	76	130	1774	76	161	1386	109
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.00	1.00	1.00	0.00	1.00	1.00	2.00	1.00	1.00	1.85	0.15
Final Sat.:	1650	1650	1650	1650	0	1650	1650	3300	1650	1650	3060	240
Capacity Analysis Module:												
Vol/Sat:	0.07	0.00	0.00	0.04	0.00	0.05	0.08	0.54	0.05	0.10	0.45	0.45
Crit Volume:	109					76		887		161		
Crit Moves:	****					****		****		****		

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                            Pittsburg/Baypoint BART
                            Cumulative With Project
                                 PM Peak Hour
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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #4 Woodhill Dr./W Leland Rd.
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):        0.643
Loss Time (sec):       0               Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        64               Level Of Service:                 B
********************************************************************************
Street Name:           Woodhill Dr.                      W Leland Rd.
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected         Protected
Rights:           Include          Include          Include           Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        1  0  0  0  1    0  0  0  0  0    0  0  1  1  0    1  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      60    0    30    0    0     0    0 1490   120   50 1320     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   60    0    30    0    0     0    0 1490   120   50 1320     0
Added Vol:      0    0     6    0    0     0    0  168     0    8  143     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:   60    0    36    0    0     0    0 1658   120   58 1463     0
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.91 0.91  0.91 0.91 0.91  0.91 0.91 0.91  0.91 0.91 0.91  0.91
PHF Volume:    66    0    40    0    0     0    0 1822   132   64 1608     0
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   66    0    40    0    0     0    0 1822   132   64 1608     0
RTOR Reduct:    0    0    40    0    0     0    0    0     0    0    0     0
RTOR Vol:      66    0     0    0    0     0    0 1822   132   64 1608     0
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   66    0     0    0    0     0    0 1822   132   64 1608     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       1.00 0.00  1.00 0.00 0.00  0.00 0.00 1.87  0.13 1.00 2.00  0.00
Final Sat.:  1720    0  1720    0    0     0    0 3208   232 1720 3440     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04 0.00  0.00 0.00 0.00  0.00 0.00 0.57  0.57 0.04 0.47  0.00
Crit Volume:   66                    0               977         64
Crit Moves:  ****                                   ****       ****
********************************************************************************
```

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--------------------------------------------------------------------------------
                          Pittsburg/Baypoint BART
                          Cumulative With Project
                               PM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
                CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #5 Southwood Dr./W Leland Rd.
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):        0.708
Loss Time (sec):       0               Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        64               Level Of Service:                 C
********************************************************************************
Street Name:           Southwood Dr.                     W Leland Rd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Y+R:         4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0
Lanes:        0  0  1! 0  0   0  0  0  0  0   0  0  1  1  0   1  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     60     0    90     0     0     0     0  1400   120   120  1310     0
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:  60     0    90     0     0     0     0  1400   120   120  1310     0
Added Vol:     0     0     6     0     0     0     0   154     0     8   202     0
PasserByVol:   0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:  60     0    96     0     0     0     0  1554   120   128  1512     0
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92
PHF Volume:   65     0   104     0     0     0     0  1689   130   139  1643     0
Reduct Vol:    0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:  65     0   104     0     0     0     0  1689   130   139  1643     0
RTOR Reduct:   0     0     0     0     0     0     0     0     0     0     0     0
RTOR Vol:     65     0   104     0     0     0     0  1689   130   139  1643     0
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:  65     0   104     0     0     0     0  1689   130   139  1643     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720  1720  1720  1720  1720  1720  1720  1720  1720  1720  1720  1720
Adjustment:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       0.38  0.00  0.62  0.00  0.00  0.00  0.00  1.86  0.14  1.00  2.00  0.00
Final Sat.:   662     0  1058     0     0     0     0  3193   247  1720  3440     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.10  0.00  0.10  0.00  0.00  0.00  0.00  0.53  0.53  0.08  0.48  0.00
Crit Volume:             170     0                       910         139
Crit Moves:             ****                            ****        ****
********************************************************************************
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Pittsburg/Baypoint BART
Cumulative With Project
PM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #6 West Bart Driveway/W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.647
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	53	Level Of Service:	B

Street Name:	West Bart Driveway						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0 0 0 0 0			1 0 0 0 1			1 0 2 0 0			0 0 1 1 0		
Volume Module:												
Base Vol:	0	0	0	450	0	80	0	1490	0	0	1350	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	450	0	80	0	1490	0	0	1350	0
Added Vol:	0	0	0	-280	0	-45	67	94	0	0	256	12
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	0	0	170	0	35	67	1584	0	0	1606	12
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	0	0	0	181	0	37	71	1685	0	0	1709	13
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	0	0	181	0	37	71	1685	0	0	1709	13
RTOR Reduct:	0	0	0	0	0	37	0	0	0	0	0	0
RTOR Vol:	0	0	0	181	0	0	71	1685	0	0	1709	13
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	0	0	181	0	0	71	1685	0	0	1709	13
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.00	0.00	0.00	1.00	0.00	1.00	1.00	2.00	0.00	0.00	1.99	0.01
Final Sat.:	0	0	0	1720	0	1720	1720	3440	0	0	3414	26
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.11	0.00	0.00	0.04	0.49	0.00	0.00	0.50	0.50
Crit Volume:		0		181			71					861
Crit Moves:				****			****					****

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                            Pittsburg/Baypoint BART
                            Cumulative With Project
                                 PM Peak Hour
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                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #7 East Bart Driveway/W Leland Rd.
********************************************************************************
Cycle (sec):         100                Critical Vol./Cap.(X):         0.785
Loss Time (sec):       0                Average Delay (sec/veh):      xxxxxx
Optimal Cycle:       106                Level Of Service:                  C
********************************************************************************
Street Name:        East Bart Driveway                 W Leland Rd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  0  0  0   1  0  0  0  1   1  0  2  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0     0     0    0     0     0   40  1900     0    0  1350   100
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:   0     0     0    0     0     0   40  1900     0    0  1350   100
Added Vol:     0     0     0  386     0    82   -3  -186     0    0   190    51
PasserByVol:   0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:   0     0     0  386     0    82   37  1714     0    0  1540   151
User Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94
PHF Volume:    0     0     0  411     0    87   39  1823     0    0  1638   161
Reduct Vol:    0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:   0     0     0  411     0    87   39  1823     0    0  1638   161
RTOR Reduct:   0     0     0    0     0    39    0     0     0    0     0     0
RTOR Vol:      0     0     0  411     0    48   39  1823     0    0  1638   161
PCE Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:   0     0     0  411     0    48   39  1823     0    0  1638   161
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720  1720
Adjustment:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Lanes:       0.00  0.00  0.00 1.00  0.00  1.00 1.00  2.00  0.00 0.00  1.82  0.18
Final Sat.:    0     0     0 1720     0  1720 1720  3440     0    0  3133   307
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.00  0.00 0.24  0.00  0.03 0.02  0.53  0.00 0.00  0.52  0.52
Crit Volume:       0           411               39                    899
Crit Moves:                   ****              ****                  ****
********************************************************************************
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                          Pittsburg/Baypoint BART
                          Cumulative With Project
                               PM Peak Hour
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                    Level Of Service Computation Report
                CCTALOS Method (Future Volume Alternative)
*******************************************************************************
Intersection #8 Oak Hill Dr./W Leland Rd.
*******************************************************************************
Cycle (sec):          90                 Critical Vol./Cap.(X):        0.953
Loss Time (sec):      16                 Average Delay (sec/veh):     xxxxxx
Optimal Cycle:       180                 Level Of Service:                 E
*******************************************************************************
Street Name:             Oak Hill Dr.                     W Leland Rd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  1! 0  0   2  0  0  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      40    0   120    0    0     0    0 1830    70  160 1410     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   40    0   120    0    0     0    0 1830    70  160 1410     0
Added Vol:      0   13     0  225   23    53   28  173     0    0  188   103
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:   40   13   120  225   23    53   28 2003    70  160 1598   103
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:    42   14   126  237   24    56   29 2108    74  168 1682   108
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   42   14   126  237   24    56   29 2108    74  168 1682   108
RTOR Reduct:    0    0     0    0    0     0    0    0     0    0    0     0
RTOR Vol:      42   14   126  237   24    56   29 2108    74  168 1682   108
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   42   14   126  237   24    56   29 2108    74  168 1682   108
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:  1.00 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.23 0.08  0.69 2.00 0.30  0.70 1.00 1.93  0.07 1.00 1.88  0.12
Final Sat.:   382  124  1145 3000  499  1151 1650 3189   111 1650 3100   200
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.11 0.11  0.11 0.08 0.05  0.05 0.02 0.66  0.66 0.10 0.54  0.54
Crit Volume:             182  118                  1091          168
Crit Moves:             ****  ****                 ****         ****
*******************************************************************************
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Pittsburg/Baypoint BART
Cumulative With Project
PM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #9 Bailey Rd./Willow Pass Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.883
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	180	Level Of Service:	D

Street Name:	Bailey Rd.		Willow Pass Rd.	
Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Split Phase	Split Phase	Protected	Protected
Rights:	Include	Include	Include	Include
Lanes:	1 0 1 0 1	1 0 0 1 0	1 0 1 1 0	1 0 1 1 0

Movement:	NB L	NB T	NB R	SB L	SB T	SB R	EB L	EB T	EB R	WB L	WB T	WB R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	440	30	310	30	20	20	20	600	340	300	400	20
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	440	30	310	30	20	20	20	600	340	300	400	20
Added Vol:	66	0	66	0	0	0	0	0	55	55	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	506	30	376	30	20	20	20	600	395	355	400	20
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	527	31	392	31	21	21	21	625	411	370	417	21
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	527	31	392	31	21	21	21	625	411	370	417	21
RTOR Reduct:	0	0	370	0	0	0	0	0	0	0	0	0
RTOR Vol:	527	31	22	31	21	21	21	625	411	370	417	21
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	527	31	22	31	21	21	21	625	411	370	417	21
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.00	1.00	1.00	0.50	0.50	1.00	1.21	0.79	1.00	1.90	0.10
Final Sat.:	1650	1650	1650	1650	825	825	1650	1990	1310	1650	3143	157
Capacity Analysis Module:												
Vol/Sat:	0.32	0.02	0.01	0.02	0.03	0.03	0.01	0.31	0.31	0.22	0.13	0.13
Crit Volume:	527				42				518	370		
Crit Moves:	****				****				****	****		

Pittsburg/Baypoint BART
Cumulative With Project
PM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #10 Bailey Rd./SR 4 WB Ramps-Canal Rd.

Cycle (sec):	100		Critical Vol./Cap.(X):	0.781
Loss Time (sec):	0		Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	104		Level Of Service:	C

Street Name:	Bailey Rd.						SR 4 WB Ramps-Canal Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	2 0	2 1	0	1 0	1 1	0	0 0	0 0	0	0 1	0 1	0
Volume Module:												
Base Vol:	290	1240	870	180	810	190	0	0	0	230	170	80
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	290	1240	870	180	810	190	0	0	0	230	170	80
Added Vol:	28	132	0	0	109	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	318	1372	870	180	919	190	0	0	0	230	170	80
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	331	1429	906	188	957	198	0	0	0	240	177	83
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	331	1429	906	188	957	198	0	0	0	240	177	83
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Vol:	331	1429	906	188	957	198	0	0	0	240	177	83
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	331	1429	906	188	957	198	0	0	0	240	177	83
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	2.00	2.00	1.00	1.00	1.66	0.34	0.00	0.00	0.00	0.96	0.71	0.33
Final Sat.:	3127	3440	1720	1720	2851	589	0	0	0	1648	1218	573
Capacity Analysis Module:												
Vol/Sat:	0.11	0.42	0.53	0.11	0.34	0.34	0.00	0.00	0.00	0.15	0.15	0.15
Crit Volume:			906	188				0			250	
Crit Moves:			****	****							****	

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                          Pittsburg/Baypoint BART
                          Cumulative With Project
                               PM Peak Hour
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                    Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #11 Bailey Rd./SR 4 EB Ramps-Bart
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):        0.902
Loss Time (sec):       0              Average Delay (sec/veh):     xxxxxx
Optimal Cycle:       180              Level Of Service:                 E
********************************************************************************
Street Name:              Bailey Rd.                    SR 4 EB Ramps-Bart
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Ignore            Ovl              Ignore
Min. Green:     0     0     0     0     0     0     0     0     0     0     0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  2  0  1   2  0  2  0  1   0  1  1  0  1   0  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1050   380   190 1100   240   120  190   690     0    0   950
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1050   380   190 1100   240   120  190   690     0    0   950
Added Vol:      0  169   107     0  144    33    -9   15    24     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0 1219   487   190 1244   273   111  205   714     0    0   950
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:     0 1270   507   198 1296   284   116  214   744     0    0   990
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0 1270   507   198 1296   284   116  214   744     0    0   990
RTOR Reduct:    0    0     0     0    0     0     0    0     0     0    0     0
RTOR Vol:       0 1270   507   198 1296   284   116  214   744     0    0   990
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0 1270   507   198 1296   284   116  214   744     0    0   990
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.00 2.00  1.00  2.00 2.00  1.00  0.70 1.30  1.00  0.00 0.00  1.00
Final Sat.:     0 3300  1650  3000 3300  1650  1159 2141  1650     0    0  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.38  0.31  0.07 0.39  0.17  0.10 0.10  0.45  0.00 0.00  0.60
Crit Volume:       635          99                           744          0
Crit Moves:       ****        ****                          ****       ****
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                         Pittsburg/Baypoint BART
                         Cumulative With Project
                              PM Peak Hour
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                     Level Of Service Computation Report
                 CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #12 Bailey Rd./Maylard St.
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):         0.659
Loss Time (sec):       0               Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        67               Level Of Service:                  B
********************************************************************************
Street Name:              Bailey Rd.                       Maylard St.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        1  0  1  1  0    1  0  2  1  0    1  1  0  0  1    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      60 1100    20    80 1530   180   280    5   140    10    5    50
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   60 1100    20    80 1530   180   280    5   140    10    5    50
Added Vol:      0  276     0     0  167     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   60 1376    20    80 1697   180   280    5   140    10    5    50
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:    65 1496    22    87 1845   196   304    5   152    11    5    54
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   65 1496    22    87 1845   196   304    5   152    11    5    54
RTOR Reduct:    0    0     0     0    0     0     0    0    65     0    0     0
RTOR Vol:      65 1496    22    87 1845   196   304    5    87    11    5    54
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   65 1496    22    87 1845   196   304    5    87    11    5    54
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  0.91 1.00  1.00  1.00 1.00  1.00
Lanes:       1.00 1.97  0.03  1.00 2.71  0.29  1.96 0.04  1.00  0.15 0.08  0.77
Final Sat.:  1650 3253    47  1650 4475   475  2947   58  1650   254  127  1269
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.04 0.46  0.46  0.05 0.41  0.41  0.10 0.09  0.05  0.04 0.04  0.04
Crit Volume:       759          87                155                          71
Crit Moves:       ****        ****               ****                        ****
********************************************************************************
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Pittsburg/Baypoint BART
Cumulative With Project
PM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #13 Bailey Rd./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	1.081
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	180	Level Of Service:	F

Street Name:	Bailey Rd.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0 1 1 0			2 0 1 0 1			1 0 1 1 0			1 0 2 0 1		
Volume Module:												
Base Vol:	320	330	100	800	350	530	380	1390	180	60	720	470
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	320	330	100	800	350	530	380	1390	180	60	720	470
Added Vol:	72	0	0	0	0	167	276	57	64	0	52	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	392	330	100	800	350	697	656	1447	244	60	772	470
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	392	330	100	800	350	697	656	1447	244	60	772	470
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	392	330	100	800	350	697	656	1447	244	60	772	470
RTOR Reduct:	0	0	0	0	0	656	0	0	0	0	0	440
RTOR Vol:	392	330	100	800	350	41	656	1447	244	60	772	30
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	392	330	100	800	350	41	656	1447	244	60	772	30
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	1.53	0.47	2.00	1.00	1.00	1.00	1.71	0.29	1.00	2.00	1.00
Final Sat.:	1650	2533	767	3000	1650	1650	1650	2824	476	1650	3300	1650
Capacity Analysis Module:												
Vol/Sat:	0.24	0.13	0.13	0.27	0.21	0.02	0.40	0.51	0.51	0.04	0.23	0.02
Crit Volume:	392				350		656				386	
Crit Moves:	****				****		****				****	

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                          Pittsburg/Baypoint BART
                          Cumulative With Project
                               PM Peak Hour
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                    Level Of Service Computation Report
                CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #14 Chestnut Dr./W Leland Rd.
********************************************************************************
Cycle (sec):         100               Critical Vol./Cap.(X):        0.738
Loss Time (sec):       0               Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        71               Level Of Service:                 C
********************************************************************************
Street Name:               Chestnut Dr.                      W Leland Rd.
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:         Permitted         Permitted         Protected         Protected
Rights:           Include           Include           Include           Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Y+R:          4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0
Lanes:        0  1  0  0  1    0  0  1! 0  0    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      20     0    10   10     0    10   10  2140    40   10  1150    10
Growth Adj:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Initial Bse:   20     0    10   10     0    10   10  2140    40   10  1150    10
Added Vol:      0     0     0    0     0     0    0    57     0    0    52     0
PasserByVol:    0     0     0    0     0     0    0     0     0    0     0     0
Initial Fut:   20     0    10   10     0    10   10  2197    40   10  1202    10
User Adj:    1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
PHF Adj:     0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92
PHF Volume:    22     0    11   11     0    11   11  2388    43   11  1307    11
Reduct Vol:     0     0     0    0     0     0    0     0     0    0     0     0
Reduced Vol:   22     0    11   11     0    11   11  2388    43   11  1307    11
RTOR Reduct:    0     0    11    0     0     0    0     0     0    0     0     0
RTOR Vol:      22     0     0   11     0    11   11  2388    43   11  1307    11
PCE Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
FinalVolume:   22     0     0   11     0    11   11  2388    43   11  1307    11
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720  1720
Adjustment:  1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00
Lanes:       1.00  0.00  1.00 0.50  0.00  0.50 1.00  1.96  0.04 1.00  1.98  0.02
Final Sat.:  1720     0  1720  860     0   860 1720  3378    62 1720  3412    28
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.01  0.00  0.00 0.01  0.00  0.01 0.01  0.71  0.71 0.01  0.38  0.38
Crit Volume:   22                           22              1216   11
Crit Moves:  ****                         ****              **** ****
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                          Pittsburg/Baypoint BART
                          Cumulative With Project
                               PM Peak Hour
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                      Level Of Service Computation Report
                   CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #16 Bailey Rd./Concord Blvd.
********************************************************************************
Cycle (sec):         100                 Critical Vol./Cap.(X):        1.023
Loss Time (sec):       0                 Average Delay (sec/veh):     xxxxxx
Optimal Cycle:       180                 Level Of Service:                 F
********************************************************************************
Street Name:               Bailey Rd.                     Concord Blvd.
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase        Protected         Protected
Rights:           Include          Include          Include           Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        0  0  1! 0  0    0  1  0  0  1    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     100  360    80   130  280   120   250 1050   120    50  500   240
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  100  360    80   130  280   120   250 1050   120    50  500   240
Added Vol:      0   41     0    11   45     8    12    0     0     0    0    18
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  100  401    80   141  325   128   262 1050   120    50  500   258
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   100  401    80   141  325   128   262 1050   120    50  500   258
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  100  401    80   141  325   128   262 1050   120    50  500   258
RTOR Reduct:    0    0     0     0    0   128     0    0     0     0    0     0
RTOR Vol:     100  401    80   141  325     0   262 1050   120    50  500   258
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  100  401    80   141  325     0   262 1050   120    50  500   258
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.17 0.69  0.14  0.30 0.70  1.00  1.00 1.79  0.21  1.00 1.32  0.68
Final Sat.:   284 1139   227   499 1151  1650  1650 2962   338  1650 2177  1123
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.35 0.35  0.35  0.28 0.28  0.00  0.16 0.35  0.35  0.03 0.23  0.23
Crit Volume:             581         466         262                     379
Crit Moves:              ****        ****        ****                    ****
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                          Pittsburg/Baypoint BART
                          Cumulative With Project
                               PM Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
                CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #17 W Leland Rd./F St.
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):         0.547
Loss Time (sec):       0              Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        50              Level Of Service:                  A
********************************************************************************
Street Name:                 F St.                         W Leland Rd.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        0  0  0  0  0   1  0  0  0  1   1  0  2  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0     0    0    0     0    0 1520     0    0 1370     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0    0     0    0    0     0    0 1520     0    0 1370     0
Added Vol:      0    0     0   67    0    55   87   87     0    0   96   106
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:    0    0     0   67    0    55   87 1607     0    0 1466   106
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:     0    0     0   67    0    55   87 1607     0    0 1466   106
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0    0     0   67    0    55   87 1607     0    0 1466   106
RTOR Reduct:    0    0     0    0    0    55    0    0     0    0    0     0
RTOR Vol:       0    0     0   67    0     0   87 1607     0    0 1466   106
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    0    0     0   67    0     0   87 1607     0    0 1466   106
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720 1720 1720  1720 1720 1720  1720 1720 1720  1720
Adjustment:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       0.00 0.00  0.00 1.00 0.00  1.00 1.00 2.00  0.00 0.00 1.87  0.13
Final Sat.:     0    0     0 1720    0  1720 1720 3440     0    0 3208   232
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.00  0.00 0.04 0.00  0.00 0.05 0.47  0.00 0.00 0.46  0.46
Crit Volume:         0          67               87                  786
Crit Moves:                   ****             ****                 ****
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APPENDIX H:
CUMULATIVE PLUS PROJECT MITIGATED LEVEL OF SERVICE CALCULATION SHEETS

FEHR PEERS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	380	0	474	0	0	0	0	2101	280	0	470	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5					5.0			5.0	4.0
Lane Util. Factor	0.95	0.91	0.95					0.91			0.95	1.00
Frt	1.00	0.89	0.85					0.98			1.00	0.85
Flt Protected	0.95	0.99	1.00					1.00			1.00	1.00
Satd. Flow (prot)	1681	1494	1504					4996			3539	1583
Flt Permitted	0.95	0.99	1.00					1.00			1.00	1.00
Satd. Flow (perm)	1681	1494	1504					4996			3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	400	0	499	0	0	0	0	2212	295	0	495	295
RTOR Reduction (vph)	0	92	213	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	312	206	76	0	0	0	0	2507	0	0	495	295
Turn Type	Split		Prot									Free
Protected Phases	4	4	4					2			6	
Permitted Phases												Free
Actuated Green, G (s)	24.7	24.7	24.7					60.7			60.7	93.9
Effective Green, g (s)	24.7	24.7	24.7					60.7			60.7	93.9
Actuated g/C Ratio	0.26	0.26	0.26					0.65			0.65	1.00
Clearance Time (s)	3.5	3.5	3.5					5.0			5.0	
Vehicle Extension (s)	4.0	4.0	4.0					4.0			4.0	
Lane Grp Cap (vph)	442	393	396					3230			2288	1583
v/s Ratio Prot	c0.19	0.14	0.05					c0.50			0.14	
v/s Ratio Perm												0.19
v/c Ratio	0.71	0.52	0.19					0.78			0.22	0.19
Uniform Delay, d1	31.3	29.6	26.9					11.8			6.8	0.0
Progression Factor	1.00	1.00	1.00					1.00			1.00	1.00
Incremental Delay, d2	5.4	1.6	0.3					1.3			0.1	0.3
Delay (s)	36.8	31.2	27.2					13.1			6.9	0.3
Level of Service	D	C	C					B			A	A
Approach Delay (s)		31.8			0.0			13.1			4.4	
Approach LOS		C			A			B			A	

Intersection Summary			
HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	93.9	Sum of lost time (s)	8.5
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	340	140	331	110	1161	60	910	351	374	510	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	6.0		5.5	6.0	4.0	5.5	7.0	7.0	5.5	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3385		1770	3539	1583	1770	3539	1583	3433	3492	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3385		1770	3539	1583	1770	3539	1583	3433	3492	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	221	358	147	348	116	1222	63	958	369	394	537	53
RTOR Reduction (vph)	0	33	0	0	0	0	0	0	152	0	5	0
Lane Group Flow (vph)	221	472	0	348	116	1222	63	958	217	394	585	0
Turn Type	Prot			Prot		Free	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						Free			2			
Actuated Green, G (s)	21.5	23.1		28.5	30.1	134.9	7.8	42.0	42.0	17.3	51.5	
Effective Green, g (s)	21.5	23.1		28.5	30.1	134.9	7.8	42.0	42.0	17.3	51.5	
Actuated g/C Ratio	0.16	0.17		0.21	0.22	1.00	0.06	0.31	0.31	0.13	0.38	
Clearance Time (s)	5.5	6.0		5.5	6.0		5.5	7.0	7.0	5.5	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	4.5	4.5	3.0	4.5	
Lane Grp Cap (vph)	282	580		374	790	1583	102	1102	493	440	1333	
v/s Ratio Prot	0.12	0.14		c0.20	0.03		0.04	0.27		0.11	0.17	
v/s Ratio Perm						c0.77			0.14			
v/c Ratio	0.78	0.81		0.93	0.15	0.77	0.62	0.87	0.44	0.90	0.44	
Uniform Delay, d1	54.5	53.8		52.2	42.1	0.0	62.1	43.9	37.1	57.9	31.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	13.3	8.6		29.5	0.1	3.7	10.6	8.0	1.1	20.2	0.4	
Delay (s)	67.7	62.4		81.7	42.2	3.7	72.7	51.8	38.1	78.1	31.4	
Level of Service	E	E		F	D	A	E	D	D	E	C	
Approach Delay (s)		64.0			22.5			49.1			50.1	
Approach LOS		E			C			D			D	

Intersection Summary			
HCM Average Control Delay	42.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	134.9	Sum of lost time (s)	5.5
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	1305	40	80	1644	120	70	12	160	25	2	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		0.97	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.86		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3523		1770	3503		1770	1603		3433	1634	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3523		1770	3503		1770	1603		3433	1634	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	1374	42	84	1731	126	74	13	168	26	2	9
RTOR Reduction (vph)	0	2	0	0	4	0	0	150	0	0	9	0
Lane Group Flow (vph)	29	1414	0	84	1853	0	74	31	0	26	2	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	3.6	56.2		7.9	60.5		9.6	10.1		3.6	4.1	
Effective Green, g (s)	3.6	56.2		7.9	60.5		9.6	10.1		3.6	4.1	
Actuated g/C Ratio	0.04	0.59		0.08	0.64		0.10	0.11		0.04	0.04	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	67	2089		148	2236		179	171		130	71	
v/s Ratio Prot	0.02	0.40		c0.05	c0.53		c0.04	c0.02		0.01	0.00	
v/s Ratio Perm												
v/c Ratio	0.43	0.68		0.57	0.83		0.41	0.18		0.20	0.03	
Uniform Delay, d1	44.6	13.1		41.8	13.2		40.0	38.6		44.2	43.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.4	0.9		4.9	2.7		1.6	0.5		0.8	0.2	
Delay (s)	49.0	14.0		46.7	15.9		41.5	39.1		45.0	43.6	
Level of Service	D	B		D	B		D	D		D	D	
Approach Delay (s)		14.7			17.2			39.8			44.6	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	18.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	94.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	270	452	359	1040	20	769	10	399	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00	1.00	1.00	
Frt	1.00	0.91		1.00	1.00		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3207		1770	3529		1681	1688	1583	1770	1723	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3207		1770	3529		1681	1688	1583	1770	1723	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	284	476	378	1095	21	809	11	420	11	11	11
RTOR Reduction (vph)	0	221	0	0	1	0	0	0	292	0	11	0
Lane Group Flow (vph)	11	539	0	378	1115	0	413	407	128	11	11	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	0.7	25.5		27.4	52.2		32.4	32.4	32.4	3.8	3.8	
Effective Green, g (s)	0.7	25.5		27.4	52.2		32.4	32.4	32.4	3.8	3.8	
Actuated g/C Ratio	0.01	0.24		0.26	0.49		0.31	0.31	0.31	0.04	0.04	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	12	771		457	1736		513	515	483	63	62	
v/s Ratio Prot	0.01	0.17		c0.21	c0.32		c0.25	0.24		0.01	c0.01	
v/s Ratio Perm									0.08			
v/c Ratio	0.92	0.70		0.83	0.64		0.81	0.79	0.27	0.17	0.18	
Uniform Delay, d1	52.7	36.8		37.1	20.0		33.9	33.7	27.9	49.6	49.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	212.2	2.8		11.7	0.8		8.9	8.1	0.3	1.3	1.4	
Delay (s)	264.8	39.6		48.8	20.8		42.9	41.8	28.2	51.0	51.1	
Level of Service	F	D		D	C		D	D	C	D	D	
Approach Delay (s)		42.8			27.9			37.5			51.0	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM Average Control Delay	34.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	106.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	437	678	375	110	1006	480	212	430	40	220	740	626
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3301		1770	3539	1559	3433	3490		3433	1863	1562
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3301		1770	3539	1559	3433	3490		3433	1863	1562
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	437	678	375	110	1006	480	212	430	40	220	740	626
RTOR Reduction (vph)	0	58	0	0	0	178	0	5	0	0	0	240
Lane Group Flow (vph)	437	995	0	110	1006	302	212	465	0	220	740	386
Confl. Peds. (#/hr)			8			2			1			1
Confl. Bikes (#/hr)			2			1						
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	24.9	48.3		11.1	34.5	34.5	6.9	36.7		12.7	42.5	42.5
Effective Green, g (s)	24.9	48.3		11.1	34.5	34.5	6.9	36.7		12.7	42.5	42.5
Actuated g/C Ratio	0.19	0.37		0.09	0.27	0.27	0.05	0.28		0.10	0.33	0.33
Clearance Time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Vehicle Extension (s)	3.0	2.2		3.0	2.2	2.2	3.0	2.2		3.0	2.2	2.2
Lane Grp Cap (vph)	339	1226		151	939	414	182	985		335	609	511
v/s Ratio Prot	c0.25	0.30		0.06	c0.28		c0.06	0.13		0.06	c0.40	
v/s Ratio Perm						0.19						0.25
v/c Ratio	1.29	0.81		0.73	1.07	0.73	1.16	0.47		0.66	1.22	0.75
Uniform Delay, d1	52.5	36.8		58.0	47.8	43.5	61.5	38.6		56.5	43.8	39.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.08	0.67	0.75
Incremental Delay, d2	150.5	5.9		16.1	50.4	10.8	118.1	0.2		4.1	109.9	5.1
Delay (s)	203.1	42.7		74.0	98.2	54.3	179.6	38.8		65.1	139.3	34.4
Level of Service	F	D		E	F	D	F	D		E	F	C
Approach Delay (s)		89.7			83.3			82.6			87.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM Average Control Delay	86.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	21.2
Intersection Capacity Utilization	114.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1150	0	1936	0	0	0	0	946	350	0	630	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5					5.0			5.0	4.0
Lane Util. Factor	0.95	0.91	0.95					0.91			0.95	1.00
Frt	1.00	0.87	0.85					0.96			1.00	0.85
Flt Protected	0.95	0.99	1.00					1.00			1.00	1.00
Satd. Flow (prot)	1681	1461	1504					4879			3539	1583
Flt Permitted	0.95	0.99	1.00					1.00			1.00	1.00
Satd. Flow (perm)	1681	1461	1504					4879			3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1150	0	1936	0	0	0	0	946	350	0	630	110
RTOR Reduction (vph)	0	16	16	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	1035	1009	1010	0	0	0	0	1296	0	0	630	110
Turn Type	Split		Prot									Free
Protected Phases	4	4	4					2			6	
Permitted Phases												Free
Actuated Green, G (s)	86.5	86.5	86.5					35.0			35.0	130.0
Effective Green, g (s)	86.5	86.5	86.5					35.0			35.0	130.0
Actuated g/C Ratio	0.67	0.67	0.67					0.27			0.27	1.00
Clearance Time (s)	3.5	3.5	3.5					5.0			5.0	
Vehicle Extension (s)	4.0	4.0	4.0					4.0			4.0	
Lane Grp Cap (vph)	1119	972	1001					1314			953	1583
v/s Ratio Prot	0.62	c0.69	0.67					c0.27			0.18	
v/s Ratio Perm												0.07
v/c Ratio	0.92	1.04	1.01					0.99			0.66	0.07
Uniform Delay, d1	18.9	21.8	21.8					47.3			42.2	0.0
Progression Factor	1.00	1.00	1.00					1.00			1.00	1.00
Incremental Delay, d2	12.8	39.3	30.7					21.4			1.9	0.1
Delay (s)	31.7	61.0	52.5					68.7			44.1	0.1
Level of Service	C	E	D					E			D	A
Approach Delay (s)		48.4			0.0			68.7			37.6	
Approach LOS		D			A			E			D	

Intersection Summary			
HCM Average Control Delay	51.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	104.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	220	240	30	328	440	516	150	500	226	1096	870	330
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	6.0		5.5	6.0	4.0	5.5	7.0	7.0	5.5	7.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3480		1770	3539	1583	1770	3539	1583	3433	3393	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3480		1770	3539	1583	1770	3539	1583	3433	3393	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	232	253	32	345	463	543	158	526	238	1154	916	347
RTOR Reduction (vph)	0	8	0	0	0	0	0	0	180	0	27	0
Lane Group Flow (vph)	232	277	0	345	463	543	158	526	58	1154	1236	0
Turn Type	Prot			Prot		Free	Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						Free			2			
Actuated Green, G (s)	19.9	20.0		22.5	22.6	132.0	13.5	26.9	26.9	38.6	52.0	
Effective Green, g (s)	19.9	20.0		22.5	22.6	132.0	13.5	26.9	26.9	38.6	52.0	
Actuated g/C Ratio	0.15	0.15		0.17	0.17	1.00	0.10	0.20	0.20	0.29	0.39	
Clearance Time (s)	5.5	6.0		5.5	6.0		5.5	7.0	7.0	5.5	7.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	4.5	4.5	3.0	4.5	
Lane Grp Cap (vph)	267	527		302	606	1583	181	721	323	1004	1337	
v/s Ratio Prot	0.13	0.08		c0.19	c0.13		0.09	0.15		c0.34	c0.36	
v/s Ratio Perm						c0.34			0.04			
v/c Ratio	0.87	0.53		1.14	0.76	0.34	0.87	0.73	0.18	1.15	0.92	
Uniform Delay, d1	54.8	51.6		54.8	52.2	0.0	58.4	49.1	43.4	46.7	38.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	24.5	1.0		96.0	5.7	0.6	33.9	4.2	0.5	79.0	11.2	
Delay (s)	79.3	52.6		150.7	57.9	0.6	92.4	53.4	43.9	125.7	49.3	
Level of Service	E	D		F	E	A	F	D	D	F	D	
Approach Delay (s)		64.6			58.6			57.6			85.8	
Approach LOS		E			E			E			F	

Intersection Summary			
HCM Average Control Delay	71.6	HCM Level of Service	E
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	132.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	90.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	2003	70	160	1598	103	40	13	120	225	23	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		0.97	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.86		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3521		1770	3507		1770	1611		3433	1667	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3521		1770	3507		1770	1611		3433	1667	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	29	2108	74	168	1682	108	42	14	126	237	24	56
RTOR Reduction (vph)	0	2	0	0	3	0	0	87	0	0	50	0
Lane Group Flow (vph)	29	2180	0	168	1787	0	42	53	0	237	30	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	4.1	70.7		10.0	76.6		5.6	10.5		7.0	11.9	
Effective Green, g (s)	4.1	70.7		10.0	76.6		5.6	10.5		7.0	11.9	
Actuated g/C Ratio	0.04	0.61		0.09	0.66		0.05	0.09		0.06	0.10	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	63	2161		154	2332		86	147		209	172	
v/s Ratio Prot	0.02	c0.62		c0.09	0.51		0.02	c0.03		c0.07	0.02	
v/s Ratio Perm												
v/c Ratio	0.46	1.01		1.09	0.77		0.49	0.36		1.13	0.17	
Uniform Delay, d1	54.5	22.2		52.6	13.2		53.4	49.2		54.1	47.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.2	21.6		98.9	1.6		4.3	1.5		103.0	0.5	
Delay (s)	59.7	43.8		151.5	14.7		57.7	50.7		157.1	47.6	
Level of Service	E	D		F	B		E	D		F	D	
Approach Delay (s)		44.0			26.5			52.3			129.5	
Approach LOS		D			C			D			F	

Intersection Summary			
HCM Average Control Delay	42.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	115.2	Sum of lost time (s)	17.0
Intersection Capacity Utilization	95.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	600	395	355	400	20	506	30	376	30	20	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		0.95	0.95	1.00	1.00	1.00	
Frt	1.00	0.94		1.00	0.99		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3329		1770	3514		1681	1694	1583	1770	1723	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.96	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3329		1770	3514		1681	1694	1583	1770	1723	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	21	625	411	370	417	21	527	31	392	31	21	21
RTOR Reduction (vph)	0	75	0	0	2	0	0	0	304	0	20	0
Lane Group Flow (vph)	21	961	0	370	436	0	279	279	88	31	22	0
Turn Type	Prot			Prot			Split		Perm	Split		
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	1.8	37.0		22.3	57.5		24.0	24.0	24.0	6.1	6.1	
Effective Green, g (s)	1.8	37.0		22.3	57.5		24.0	24.0	24.0	6.1	6.1	
Actuated g/C Ratio	0.02	0.35		0.21	0.54		0.23	0.23	0.23	0.06	0.06	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	30	1158		371	1899		379	382	357	101	99	
v/s Ratio Prot	0.01	c0.29		c0.21	0.12		c0.17	0.16		c0.02	0.01	
v/s Ratio Perm									0.06			
v/c Ratio	0.70	0.83		1.00	0.23		0.74	0.73	0.25	0.31	0.22	
Uniform Delay, d1	52.0	31.8		42.0	12.8		38.3	38.2	33.8	48.1	47.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	52.7	5.1		45.7	0.1		7.3	7.0	0.4	1.7	1.2	
Delay (s)	104.8	36.9		87.7	12.9		45.5	45.2	34.2	49.8	49.0	
Level of Service	F	D		F	B		D	D	C	D	D	
Approach Delay (s)		38.2			47.1			40.7			49.4	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	41.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	106.4	Sum of lost time (s)	17.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	656	1447	244	60	772	470	392	330	100	800	350	697
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3446		1770	3539	1557	3433	3403		3433	1863	1562
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3446		1770	3539	1557	3433	3403		3433	1863	1562
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	656	1447	244	60	772	470	392	330	100	800	350	697
RTOR Reduction (vph)	0	10	0	0	0	269	0	22	0	0	0	393
Lane Group Flow (vph)	656	1681	0	60	772	201	392	408	0	800	350	304
Confl. Peds. (#/hr)			6			1			3			1
Confl. Bikes (#/hr)						3						
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	33.9	55.9		5.0	27.0	27.0	15.1	25.0		22.9	32.8	32.8
Effective Green, g (s)	33.9	55.9		5.0	27.0	27.0	15.1	25.0		22.9	32.8	32.8
Actuated g/C Ratio	0.26	0.43		0.04	0.21	0.21	0.12	0.19		0.18	0.25	0.25
Clearance Time (s)	5.1	5.5		5.1	5.5	5.5	5.1	5.5		5.1	5.5	5.5
Vehicle Extension (s)	3.0	2.2		3.0	2.2	2.2	3.0	2.2		3.0	2.2	2.2
Lane Grp Cap (vph)	462	1482		68	735	323	399	654		605	470	394
v/s Ratio Prot	c0.37	c0.49		0.03	c0.22		c0.11	0.12		c0.23	0.19	
v/s Ratio Perm						0.13						c0.19
v/c Ratio	1.42	1.13		0.88	1.05	0.62	0.98	0.62		1.32	0.74	0.77
Uniform Delay, d1	48.1	37.0		62.2	51.5	46.8	57.3	48.2		53.5	44.7	45.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		0.70	0.66	2.06
Incremental Delay, d2	201.3	69.3		69.4	47.2	2.9	40.2	1.5		154.3	8.4	11.2
Delay (s)	249.4	106.3		131.6	98.7	49.7	97.5	49.6		191.6	37.8	104.1
Level of Service	F	F		F	F	D	F	D		F	D	F
Approach Delay (s)		146.3			82.5			72.5			129.4	
Approach LOS		F			F			E			F	

Intersection Summary			
HCM Average Control Delay	118.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	26.3
Intersection Capacity Utilization	111.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Pittsburg/Baypoint BART
Cumulative With Project
AM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #1 Willow Pass Rd./SR 4 EB Ramps

Cycle (sec):	180	Critical Vol./Cap.(X):	0.731
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	85	Level Of Service:	C

Street Name:	Willow Pass Rd.						SR 4 EB Ramps					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Ignore			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	0 0	2	1 0	0 0	2	0 1	1 0	1!	0 1	0 0	0	0 0
Volume Module:												
Base Vol:	0	1990	280	0	470	280	380	0	400	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1990	280	0	470	280	380	0	400	0	0	0
Added Vol:	0	111	0	0	0	0	0	0	74	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	0	2101	280	0	470	280	380	0	474	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
PHF Volume:	0	2388	318	0	534	318	432	0	539	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	2388	318	0	534	318	432	0	539	0	0	0
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Vol:	0	2388	318	0	534	318	432	0	539	0	0	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	2388	318	0	534	318	432	0	539	0	0	0
Saturation Flow Module:												
Sat/Lane:	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720	1720
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	0.91	1.00	0.91	1.00	1.00	1.00
Lanes:	0.00	2.65	0.35	0.00	2.00	1.00	1.33	0.01	1.66	0.00	0.00	0.00
Final Sat.:	0	4553	607	0	3440	1720	2087	0	2603	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.52	0.52	0.00	0.16	0.18	0.21	0.00	0.21	0.00	0.00	0.00
Crit Volume:		902		0			323				0	
Crit Moves:		****		****			****					

Pittsburg/Baypoint BART
Cumulative With Project
AM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #2 San Marco Blvd./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.786
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	106	Level Of Service:	C

Street Name:	San Marco Blvd.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Ignore		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	2 0	1	2 0	1 1	0	1 0	1 1	0	1 0	2 0	1
Volume Module:												
Base Vol:	60	910	350	300	510	50	210	340	140	330	110	1050
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	60	910	350	300	510	50	210	340	140	330	110	1050
Added Vol:	0	0	1	74	0	0	0	0	0	1	0	111
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	60	910	351	374	510	50	210	340	140	331	110	1161
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	63	958	369	394	537	53	221	358	147	348	116	1222
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	63	958	369	394	537	53	221	358	147	348	116	1222
RTOR Reduct:	0	0	348	0	0	0	0	0	0	0	0	0
RTOR Vol:	63	958	21	394	537	53	221	358	147	348	116	1222
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	63	958	21	394	537	53	221	358	147	348	116	1222
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	2.00	1.82	0.18	1.00	1.42	0.58	1.00	2.00	1.00
Final Sat.:	1650	3300	1650	3000	3005	295	1650	2338	962	1650	3300	1650
Capacity Analysis Module:												
Vol/Sat:	0.04	0.29	0.01	0.13	0.18	0.18	0.13	0.15	0.15	0.21	0.04	0.74
Crit Volume:		479		197				253		348		
Crit Moves:		****		****				****		****		

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--------------------------------------------------------------------------------
                            Pittsburg/Baypoint BART
                            Cumulative With Project
                                 AM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #8 Oak Hill Dr./W Leland Rd.
********************************************************************************
Cycle (sec):          130                Critical Vol./Cap.(X):        0.664
Loss Time (sec):       16                Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         85                Level Of Service:                 B
********************************************************************************
Street Name:              Oak Hill Dr.                      W Leland Rd.
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected         Protected         Protected         Protected
Rights:           Include           Include           Include           Include
Min. Green:    0     0     0     0     0     0     0     0     0     0     0     0
Y+R:         4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:       1  0  0  1  0    2  0  0  1  0    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       70    0   160     0     0     0     0 1190    40    80 1410     0
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    70    0   160     0     0     0     0 1190    40    80 1410     0
Added Vol:       0   12     0    25     2     9    28  115     0     0  234   120
PasserByVol:     0    0     0     0     0     0     0    0     0     0    0     0
Initial Fut:    70   12   160    25     2     9    28 1305    40    80 1644   120
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     70   12   160    25     2     9    28 1305    40    80 1644   120
Reduct Vol:      0    0     0     0     0     0     0    0     0     0    0     0
Reduced Vol:    70   12   160    25     2     9    28 1305    40    80 1644   120
RTOR Reduct:     0    0     0     0     0     0     0    0     0     0    0     0
RTOR Vol:       70   12   160    25     2     9    28 1305    40    80 1644   120
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    70   12   160    25     2     9    28 1305    40    80 1644   120
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:   1.00 1.00  1.00  0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:        1.00 0.07  0.93  2.00 0.18  0.82  1.00 1.94  0.06  1.00 1.86  0.14
Final Sat.:   1650  115  1535  3000  300  1350  1650 3202    98  1650 3076   224
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.04 0.10  0.10  0.01 0.01  0.01  0.02 0.41  0.41  0.05 0.53  0.53
Crit Volume:              172    13                28                  882
Crit Moves:              ****  ****              ****                 ****
********************************************************************************
```

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--------------------------------------------------------------------------------
                           Pittsburg/Baypoint BART
                           Cumulative With Project
                                AM Peak Hour
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
                    CCTALOS Method (Future Volume Alternative)
*******************************************************************************
Intersection #9 Bailey Rd./Willow Pass Rd.
*******************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):         0.804
Loss Time (sec):        0               Average Delay (sec/veh):      xxxxxx
Optimal Cycle:        116               Level Of Service:                  D
*******************************************************************************
Street Name:                Bailey Rd.                    Willow Pass Rd.
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        1  1  0  0  1    1  0  0  1  0    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     750   10   380    10   10    10    10  270   400   330 1040    20
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  750   10   380    10   10    10    10  270   400   330 1040    20
Added Vol:     19    0    19     0    0     0     0    0    52    29    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  769   10   399    10   10    10    10  270   452   359 1040    20
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:   809   11   420    11   11    11    11  284   476   378 1095    21
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  809   11   420    11   11    11    11  284   476   378 1095    21
RTOR Reduct:    0    0   378     0    0     0     0    0     0     0    0     0
RTOR Vol:     809   11    42    11   11    11    11  284   476   378 1095    21
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  809   11    42    11   11    11    11  284   476   378 1095    21
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650  1650 1650  1650  1650 1650  1650  1650 1650  1650
Adjustment:  0.91 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       1.97 0.03  1.00  1.00 0.50  0.50  1.00 1.00  1.00  1.00 1.96  0.04
Final Sat.:  2961   42  1650  1650  825   825  1650 1650  1650  1650 3238    62
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.27 0.25  0.03  0.01 0.01  0.01  0.01 0.17  0.29  0.23 0.34  0.34
Crit Volume:  410                     21                     476   378
Crit Moves:  ****                   ****                    ****  ****
*******************************************************************************
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--------------------------------------------------------------------------------
                        Pittsburg/Baypoint BART
                        Cumulative With Project
                             AM Peak Hour
--------------------------------------------------------------------------------
                  Level Of Service Computation Report
              CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #13 Bailey Rd./W Leland Rd.
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):        1.089
Loss Time (sec):       0              Average Delay (sec/veh):     xxxxxx
Optimal Cycle:       180              Level Of Service:                 F
********************************************************************************
Street Name:              Bailey Rd.                       W Leland Rd.
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        2  0  1  1  0   2  0  1  0  1   1  0  1  1  0   1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     180  430    40  220  740   330  370  660   320  110  980   480
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  180  430    40  220  740   330  370  660   320  110  980   480
Added Vol:     32    0     0    0    0   296   67   18    55    0   26     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  212  430    40  220  740   626  437  678   375  110 1006   480
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   212  430    40  220  740   626  437  678   375  110 1006   480
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  212  430    40  220  740   626  437  678   375  110 1006   480
RTOR Reduct:    0    0     0    0    0   437    0    0     0    0    0   121
RTOR Vol:     212  430    40  220  740   189  437  678   375  110 1006   359
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  212  430    40  220  740   189  437  678   375  110 1006   359
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:  0.91 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       2.00 1.83  0.17 2.00 1.00  1.00 1.00 1.29  0.71 1.00 2.00  1.00
Final Sat.:  3000 3019   281 3000 1650  1650 1650 2125  1175 1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.07 0.14  0.14 0.07 0.45  0.11 0.26 0.32  0.32 0.07 0.30  0.22
Crit Volume:  106                  740         437                   503
Crit Moves:  ****                 ****        ****                  ****
********************************************************************************
```

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--------------------------------------------------------------------------------
                          Pittsburg/Baypoint BART
                          Cumulative With Project
                               PM Peak Hour
--------------------------------------------------------------------------------

                    Level Of Service Computation Report
                CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #1 Willow Pass Rd./SR 4 EB Ramps
********************************************************************************
Cycle (sec):         180               Critical Vol./Cap.(X):        0.909
Loss Time (sec):       0               Average Delay (sec/veh):     xxxxxx
Optimal Cycle:       180               Level Of Service:                 E
********************************************************************************
Street Name:         Willow Pass Rd.                    SR 4 EB Ramps
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase       Split Phase
Rights:           Include          Ignore          Include           Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
Lanes:        0  0  2  1  0    0  0  2  0  1    1  0  1! 0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  820   350     0  630   110  1150     0  1780     0     0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  820   350     0  630   110  1150     0  1780     0     0     0
Added Vol:      0  126     0     0    0     0     0     0   156     0     0     0
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:    0  946   350     0  630   110  1150     0  1936     0     0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:     0  946   350     0  630   110  1150     0  1936     0     0     0
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
Reduced Vol:    0  946   350     0  630   110  1150     0  1936     0     0     0
RTOR Reduct:    0    0     0     0    0     0     0     0     0     0     0     0
RTOR Vol:       0  946   350     0  630   110  1150     0  1936     0     0     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0  946   350     0  630   110  1150     0  1936     0     0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1720 1720  1720  1720 1720  1720  1720 1720  1720  1720 1720  1720
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  0.91 1.00  0.91  1.00 1.00  1.00
Lanes:       0.00 2.19  0.81  0.00 2.00  1.00  1.11 0.01  1.88  0.00 0.00  0.00
Final Sat.:     0 3766  1394     0 3440  1720  1748     0  2943     0     0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.25  0.25  0.00 0.18  0.06  0.66 0.00  0.66  0.00 0.00  0.00
Crit Volume:       432           0                          1029           0
Crit Moves:       ****        ****                          ****
********************************************************************************
```

Pittsburg/Baypoint BART
Cumulative With Project
PM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #2 San Marco Blvd./W Leland Rd.

Cycle (sec):	100	Critical Vol./Cap.(X):	0.839
Loss Time (sec):	0	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	142	Level Of Service:	D

Street Name:	San Marco Blvd.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Protected			Protected			Protected			Protected	
Rights:		Include			Include			Include			Ignore	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0 2 0 1			2 0 1 1 0			1 0 1 1 0			1 0 2 0 1		
Volume Module:												
Base Vol:	150	500	220	940	870	330	220	240	30	320	440	390
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	150	500	220	940	870	330	220	240	30	320	440	390
Added Vol:	0	0	6	156	0	0	0	0	0	8	0	126
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	150	500	226	1096	870	330	220	240	30	328	440	516
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	158	526	238	1154	916	347	232	253	32	345	463	543
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	158	526	238	1154	916	347	232	253	32	345	463	543
RTOR Reduct:	0	0	238	0	0	0	0	0	0	0	0	0
RTOR Vol:	158	526	0	1154	916	347	232	253	32	345	463	543
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	158	526	0	1154	916	347	232	253	32	345	463	543
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	2.00	1.00	2.00	1.45	0.55	1.00	1.78	0.22	1.00	2.00	1.00
Final Sat.:	1650	3300	1650	3000	2393	908	1650	2933	367	1650	3300	1650
Capacity Analysis Module:												
Vol/Sat:	0.10	0.16	0.00	0.38	0.38	0.38	0.14	0.09	0.09	0.21	0.14	0.33
Crit Volume:		263		577					142	345		
Crit Moves:		****		****					****	****		

Pittsburg/Baypoint BART
Cumulative With Project
PM Peak Hour

Level Of Service Computation Report
CCTALOS Method (Future Volume Alternative)

Intersection #8 Oak Hill Dr./W Leland Rd.

Cycle (sec):	130	Critical Vol./Cap.(X):	0.927
Loss Time (sec):	16	Average Delay (sec/veh):	xxxxxx
Optimal Cycle:	180	Level Of Service:	E

Street Name:	Oak Hill Dr.						W Leland Rd.					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lanes:	1 0	0	1 0	2 0	0	1 0	1 0	1	1 0	1 0	1	1 0
Volume Module:												
Base Vol:	40	0	120	0	0	0	0	1830	70	160	1410	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	40	0	120	0	0	0	0	1830	70	160	1410	0
Added Vol:	0	13	0	225	23	53	28	173	0	0	188	103
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	40	13	120	225	23	53	28	2003	70	160	1598	103
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	42	14	126	237	24	56	29	2108	74	168	1682	108
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	42	14	126	237	24	56	29	2108	74	168	1682	108
RTOR Reduct:	0	0	0	0	0	0	0	0	0	0	0	0
RTOR Vol:	42	14	126	237	24	56	29	2108	74	168	1682	108
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	42	14	126	237	24	56	29	2108	74	168	1682	108
Saturation Flow Module:												
Sat/Lane:	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650	1650
Adjustment:	1.00	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	1.00	0.10	0.90	2.00	0.30	0.70	1.00	1.93	0.07	1.00	1.88	0.12
Final Sat.:	1650	161	1489	3000	499	1151	1650	3189	111	1650	3100	200
Capacity Analysis Module:												
Vol/Sat:	0.03	0.08	0.08	0.08	0.05	0.05	0.02	0.66	0.66	0.10	0.54	0.54
Crit Volume:			140	118				1091		168		
Crit Moves:			****	****				****		****		

```
--------------------------------------------------------------------------------
                        Pittsburg/Baypoint BART
                        Cumulative With Project
                             PM Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
                  CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #9 Bailey Rd./Willow Pass Rd.
********************************************************************************
Cycle (sec):          100                 Critical Vol./Cap.(X):        0.750
Loss Time (sec):        0                 Average Delay (sec/veh):     xxxxxx
Optimal Cycle:         91                 Level Of Service:                 C
********************************************************************************
Street Name:                Bailey Rd.                       Willow Pass Rd.
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R   L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Split Phase      Split Phase       Protected         Protected
Rights:           Include          Include          Include           Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        1  1  0  0  1   1  0  0  1  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     440   30   310   30   20    20   20  600   340  300  400    20
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  440   30   310   30   20    20   20  600   340  300  400    20
Added Vol:     66    0    66    0    0     0    0    0    55   55    0     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  506   30   376   30   20    20   20  600   395  355  400    20
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96 0.96 0.96  0.96 0.96 0.96  0.96 0.96 0.96  0.96
PHF Volume:   527   31   392   31   21    21   21  625   411  370  417    21
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  527   31   392   31   21    21   21  625   411  370  417    21
RTOR Reduct:    0    0   370    0    0     0    0    0     0    0    0     0
RTOR Vol:     527   31    22   31   21    21   21  625   411  370  417    21
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  527   31    22   31   21    21   21  625   411  370  417    21
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:  0.91 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       1.89 0.11  1.00 1.00 0.50  0.50 1.00 1.21  0.79 1.00 1.90  0.10
Final Sat.:  2832  185  1650 1650  825   825 1650 1990  1310 1650 3143   157
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.19 0.17  0.01 0.02 0.03  0.03 0.01 0.31  0.31 0.22 0.13  0.13
Crit Volume:  279                     42                   518  370
Crit Moves:  ****                   ****                  **** ****
********************************************************************************
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--------------------------------------------------------------------------------
                        Pittsburg/Baypoint BART
                        Cumulative With Project
                             PM Peak Hour
--------------------------------------------------------------------------------

                  Level Of Service Computation Report
               CCTALOS Method (Future Volume Alternative)
********************************************************************************
Intersection #13 Bailey Rd./W Leland Rd.
********************************************************************************
Cycle (sec):          100               Critical Vol./Cap.(X):        1.029
Loss Time (sec):        0               Average Delay (sec/veh):     xxxxxx
Optimal Cycle:        180               Level Of Service:                 F
********************************************************************************
Street Name:                Bailey Rd.                     W Leland Rd.
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected         Protected         Protected         Protected
Rights:           Include           Include           Include           Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Y+R:          4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0  4.0  4.0   4.0
Lanes:        2  0  1  1  0    2  0  1  0  1    1  0  1  1  0    1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     320  330   100  800  350   530  380 1390   180   60  720   470
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:  320  330   100  800  350   530  380 1390   180   60  720   470
Added Vol:     72    0     0    0    0   167  276   57    64    0   52     0
PasserByVol:    0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:  392  330   100  800  350   697  656 1447   244   60  772   470
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Volume:   392  330   100  800  350   697  656 1447   244   60  772   470
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:  392  330   100  800  350   697  656 1447   244   60  772   470
RTOR Reduct:    0    0     0    0    0   656    0    0     0    0    0   440
RTOR Vol:     392  330   100  800  350    41  656 1447   244   60  772    30
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:  392  330   100  800  350    41  656 1447   244   60  772    30
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1650 1650  1650 1650 1650  1650 1650 1650  1650 1650 1650  1650
Adjustment:  0.91 1.00  1.00 0.91 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Lanes:       2.00 1.53  0.47 2.00 1.00  1.00 1.00 1.71  0.29 1.00 2.00  1.00
Final Sat.:  3000 2533   767 3000 1650  1650 1650 2824   476 1650 3300  1650
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.13 0.13  0.13 0.27 0.21  0.02 0.40 0.51  0.51 0.04 0.23  0.02
Crit Volume:             215  400              656                    386
Crit Moves:             ****  ****             ****                   ****
********************************************************************************
```

APPENDIX D: TRAFFIC NOISE MODELING

APPENDIX A
TRAFFIC NOISE MODELING

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
	---	-------	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

EXISTING CONDITIONS

BAILEY RD, N OF W. LELAND RD
ADT: 16620 SPEED: 30 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 63.29
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	58.9	118.3	250.8

BAILEY RD, S OF W. LELAND RD
ADT: 6730 SPEED: 30 ACTIVE HALF WIDTH (FT): 15
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 60.03
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	65.2	137.6

W. LELAND RD, E OF BAILEY RD
ADT: 20940 SPEED: 30 ACTIVE HALF WIDTH (FT): 15
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 64.96
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	64.6	136.1	291.8

W. W. LELAND RD, BAILEY TO OAK HILLS DR
ADT: 13710 SPEED: 30 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 62.45
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	104.7	220.9

LELAND RD, OAK HILLS DR TO E BART DR
ADT: 11970 SPEED: 30 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 61.86
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	96.2	202.0

W. LELAND RD, EBART DR TO W BART DR
ADT: 12330 SPEED: 30 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 61.99
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	98.0	206.0

W. LELAND RD, W BART DR TO WOODHILL DR
ADT: 8590 SPEED: 30 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 60.42
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	78.4	162.6

W. LELAND RD, WOODHILL DR TO ALVES RANCH DR
ADT: 9560 SPEED: 40 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 63.91
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	63.9	129.8	275.9

HWY 4
TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.47	12.53	9.30
M-TRUCKS	0.24	0.24	0.24
H-TRUCKS	0.66	0.66	0.66

ADT: 126000 SPEED: 64 ACTIVE HALF WIDTH (FT): 72
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 80.15
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
473.4	1010.4	2172.0	4676.5

EXISTING PLUS PROJECT CONDITIONS

BAILEY RD, N OF W. LELAND RD
ADT: 21080 SPEED: 30 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 64.32
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	67.4	137.9	293.4

BAILEY RD, S OF W. LELAND RD
ADT: 8100 SPEED: 30 ACTIVE HALF WIDTH (FT): 15
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 60.83
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	73.4	155.5

W. LELAND RD, E OF BAILEY RD
ADT: 22070 SPEED: 30 ACTIVE HALF WIDTH (FT): 15
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 65.18
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	66.8	140.9	302.2

W. LELAND RD, BAILEY TO OAK HILLS DR
ADT: 20670 SPEED: 30 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 64.23
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	66.7	136.1	289.7

W. LELAND RD, OAK HILLS DR TO E BART DR
ADT: 13590 SPEED: 30 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 62.41
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	104.1	219.6

W. LELAND RD, EBART DR TO W BART DR
ADT: 12430 SPEED: 30 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 62.02
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	98.5	207.1

W. LELAND RD, W BART DR TO WOODHILL DR
ADT: 11850 SPEED: 30 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 61.82
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	95.6	200.7

W. LELAND RD, WOODHILL DR TO ALVES RANCH DR
ADT: 12680 SPEED: 40 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 65.14
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	75.4	155.9	332.7

HWY 4
TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.47	12.53	9.30
M-TRUCKS	0.24	0.24	0.24
H-TRUCKS	0.66	0.66	0.66

ADT: 128000 SPEED: 64 ACTIVE HALF WIDTH (FT): 72
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 80.22
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
478.3	1021.0	2194.9	4725.9

CUMULATIVE CONDITIONS

BAILEY RD, N OF W. LELAND RD
ADT: 28600 SPEED: 30 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 65.64
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	80.9	168.1	359.2

BAILEY RD, S OF W. LELAND RD
ADT: 13400 SPEED: 30 ACTIVE HALF WIDTH (FT): 15
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 63.02
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	101.6	217.0

W. LELAND RD, E OF BAILEY RD
ADT: 35400 SPEED: 30 ACTIVE HALF WIDTH (FT): 15
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 67.24
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	90.4	192.6	413.8

W. LELAND RD, BAILEY TO OAK HILLS DR
ADT: 35200 SPEED: 30 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 66.55
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	91.9	192.6	412.3

W. LELAND RD, OAK HILLS DR TO E BART DR
ADT: 33500 SPEED: 30 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 66.33
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	89.1	186.4	399.0

W. LELAND RD, EBART DR TO W BART DR
ADT: 32900 SPEED: 30 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 66.25
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	88.1	184.3	394.2

W. LELAND RD, W BART DR TO WOODHILL DR
ADT: 28900 SPEED: 30 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 65.69
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	81.4	169.3	361.7

W. LELAND RD, WOODHILL DR TO ALVES RANCH DR
ADT: 29900 SPEED: 40 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 68.87
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
63.5	128.9	273.9	588.2

HWY4

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.47	12.53	9.30
M-TRUCKS	0.24	0.24	0.24
H-TRUCKS	0.66	0.66	0.66

ADT: 168000 SPEED: 64 ACTIVE HALF WIDTH (FT): 72
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 81.40
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
571.3	1223.0	2630.7	5664.9

CUMULATIVE PLUS PROJECT CONDITIONS

BAILEY RD, N OF W. LELAND RD
ADT: 33030 SPEED: 30 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 66.27
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	88.4	184.7	395.3

BAILEY RD, S OF W. LELAND RD
ADT: 14760 SPEED: 30 ACTIVE HALF WIDTH (FT): 15
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 63.44
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	108.2	231.3

W. LELAND RD, E OF BAILEY RD
ADT: 36490 SPEED: 30 ACTIVE HALF WIDTH (FT): 15
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 67.37
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	92.2	196.5	422.3

W. LELAND RD, BAILEY TO OAK HILLS DR
ADT: 42080 SPEED: 30 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 67.32
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	102.8	216.6	464.3

W. LELAND RD, OAK HILLS DR TO E BART DR
ADT: 37910 SPEED: 30 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 66.87
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	96.3	202.2	433.2

W. LELAND RD, EBART DR TO W BART DR
ADT: 33730 SPEED: 30 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 66.36
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	89.5	187.3	400.8

W. LELAND RD, W BART DR TO WOODHILL DR
ADT: 32150 SPEED: 30 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 66.15
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	86.9	181.5	388.2

W. LELAND RD, WOODHILL DR TO ALVES RANCH DR
ADT: 33010 SPEED: 40 ACTIVE HALF WIDTH (FT): 24
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 69.30
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
67.2	137.4	292.4	628.2

HWY4
TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.47	12.53	9.30
M-TRUCKS	0.24	0.24	0.24
H-TRUCKS	0.66	0.66	0.66

ADT: 170000 SPEED: 64 ACTIVE HALF WIDTH (FT): 72
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 81.45
* * DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL * *

70 CNEL	65 CNEL	60 CNEL	55 CNEL
575.8	1232.6	2651.6	5709.8

BART PITTSBURG/BAYPOINT TRANSIT STATION - BUS SERVICE																										
BUS#	DIR	HOURLY DISTRIBUTION																								
		12MIDNIGHT	1	2	3	4	5	6	7	8	9	10	11	12NOON	1	2	3	4	5	6	7	8	9	10	11	
200	WB							1	1	1		1	1	1	1	1	1	1	1							
	EB									1	1	1	1	1	1	1	1	1								
201	WB							2	2	1	1	1	1	1		2	2	1	2	1						
	EB								1	2	1	1		1	1	1	1	2	2	1	1					
300	WB					1	2	3	2	3	2	2	3	2	2	2	2	2	2	1	1	1				
	EB							1	3	3	1	2	2	2	2	2	2	3	3	4	2	2	1			
380	WB						1	2	2	2	3	1	1	1	1		1	4	2	2	2	2	1	1		
	EB						2	2	2	1	1	1	1	1	3	1	1	2	3	2	1	1	1			
387	WB							2	1	1	1	1	1		1	1	1	1	1	1	1	1	1			
	EB							1	1	1	1	1	1	1	1	1	1	1	1	1	1					
388	WB							1	2	1	2	2	2	1	1	1	1	1	2	2	1	2	1			
	EB						1	1	2	2	1	2	1		2	1	1	1	1	2	1	1		1		
389						1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1			
390	WB					1	1	2	2	1																
	EB							1										2	2	2	2					
391	WB						1	2	2	2	2	1	1	1	1	1		2	2	1	2	1	1	1	1	
	EB	1					1	2	2	2	1	1			1	2	1	2	2	1	2	1	1	1	1	
392	WB								1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	EB								1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
393	WB							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
	EB	1						1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	
394	WB									1	1	1	1	1	1	1	1	1	1	1	1	1				
	EB								1	1	1	1	1	1	1	1	1	1	1	1	1					
52	SB							1				1								1						
	NB							1							1				1							
EXISTING TOTAL #BUSES/HR:		2	0	0	0	3	10	28	31	31	24	26	23	20	26	24	23	33	34	29	24	18	11	8	5	433
EXISTING AVG #BUSES/HR DAY:		25																								
EXISTING AVG #BUSES/HR NIGHT:		9																								
* Derived from Pittsburg/Bay Point Station-Transit Unlimited. http://www.transitunlimited.org/Pittsburg/Bay_Point_Station.																										
FUTURE AVG #BUSES/HR DAY:		34														509										584.55
FUTURE AVG #BUSES/HR NIGHT:		13														75.6										
*Assumes an approximate 35% increase in transit demand (Fehr&Peers 2011)																585										

BART PITTSBURG/BAYPOINT TRANSIT STATION - RAIL SERVICE

	HOURLY DISTRIBUTION																							
	12MIDNIGHT	1	2	3	4	5	6	7	8	9	10	11	12NOON	1	2	3	4	5	6	7	8	9	10	11
PITTSBURG/BAYPOINT-MILLBRAE/SFIA								1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
MILLBRAE/SFIA-PITTSBURG/BAYPOINT	3	1							1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
TOTAL TRAINS/HOUR:	3	1	0	0	0	0	0	1	4	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
TOTAL DAILY AVG:	99																							
AVG #TRAINS/HR NIGHT:	2																							
AVG #TRAINS/HR DAY:	6																							
FUTURE AVG #TRAINS/HR NIGHT:	2																							
FUTURE AVG #TRAINS/HR DAY:	7																							

**Assumes an approximate 35% increase in transit demand through year 2030 (Fehr&Peers 2011)*

Source: BART. 2011. BART-Schedules by Line. Website url: http://www.bart.gov/schedules/bylineresults.aspx?route=2&date=02/20/2011.

PREDICTED TRANSIT NOISE LEVELS AT PROPOSED LAND USES - BUS TRANSIT SERVICE

BUS TRANSIT CENTER	
#BUSES/HR DAY:	34
#BUSES/HR NIGHT:	13
REFERENCE DISTANCE:	50
DAY LEQ:	67.7
NIGHT LEQ:	63.5
LDN:	70.8

PREDICTED NOISE LEVELS AT NEAREST ONSITE RECEPTORS

PHASE	LAND USE	DISTANCE	LEQ-DAY	LEQ-NIGHT	LDN
1	RESIDENTIAL	50	68	63	70
3	RESIDENTIAL	150	51	47	53
5	RESIDENTIAL	200	48	44	50
6	RESIDENTIAL	175	50	45	51

PARKING GARAGE 1	
#AUTOS/HR DAY:	314
#AUTOS/HR NIGHT:	157
REFERENCE DISTANCE:	50
DAY LEQ:	60.4
NIGHT LEQ:	57.4
LDN:	64.4

PREDICTED NOISE LEVELS AT NEAREST ONSITE RECEPTORS

PHASE	LAND USE	DISTANCE	LEQ-DAY	LEQ-NIGHT	LDN
1	RESIDENTIAL	75	56	53	59
3	RESIDENTIAL	200	41	38	44
5	RESIDENTIAL	250	38	35	41
6	RESIDENTIAL	225	40	37	43

PARKING GARAGE 2	
#AUTOS/HR DAY:	314
#AUTOS/HR NIGHT:	157
REFERENCE DISTANCE:	50
DAY LEQ:	60.4
NIGHT LEQ:	57.4
LDN:	64.4

PREDICTED NOISE LEVELS AT NEAREST ONSITE RECEPTORS

PHASE	LAND USE	DISTANCE	LEQ-DAY	LEQ-NIGHT	LDN
1	RESIDENTIAL	50	60	57	63
3	RESIDENTIAL	50	60	57	63
5	RESIDENTIAL	50	60	57	63
6	RESIDENTIAL	275	37	34	40

COMBINED NOISE LEVELS AT NEAREST ONSITE RECEPTORS

PHASE	LAND USE	LEQ-DAY	LEQ-NIGHT	LDN
1	RESIDENTIAL	69	64	71
3	RESIDENTIAL	61	58	64
5	RESIDENTIAL	60	58	64
6	RESIDENTIAL	51	45	52

Transit noise levels were calculated in accordance with FTA's Transit Noise & Vibration Impact Assessment (2006).

Bus transit center hourly activity is based on existing hourly distribution. To be conservative, the number of buses assumes an approximate 35% increase in transit demand for future years (Fehr&Peers 2011)

To ensure a conservative analysis, daytime parking garage activity is based on the maximum a.m. peak-hour number of vehicles accessing the site for future cumulative conditions (i.e. 629vehicles) and assuming traffic volumes would be equally distributed between the two proposed parking garages. Nighttime garage activity is based on the calculated average-hourly traffic volumes based on an estimated 3,140 vehicles/day (assuming pkhr volumes represent approximately 10% of daily volumes) averaged over an approximate 20 hour operational day (i.e., 157 vehicles/hour.

PREDICTED TRANSIT NOISE LEVELS AT NEAREST SITE BOUNDARY - RAIL			
DISTANCE TO SITE BOUNDARY (FEET):		155	
LOCOMOTIVES		EXISTING	FUTURE
	LOCOMOTIVES/TRAIN:	2	2
	SPEED (MPH):	40	40
	AVG #EVENTS/TOTAL DAYTIME HOUR:	6	7
	AVG #EVENTS/TOTAL NIGHTTIME HOUR:	2	3
	LDN:	60	61
RAILCARS			
	CARS/TRAIN:	10	10
	SPEED (MPH):	40	40
	AVG #EVENTS/TOTAL DAYTIME HOUR:	6	7
	AVG #EVENTS/TOTAL NIGHTTIME HOUR:	2	3
	LDN:	58	59
TRANSIT WARNING DEVICE			
	SPEED (MPH):	40	40
	AVG #EVENTS/TOTAL DAYTIME HOUR:	6	7
	AVG #EVENTS/TOTAL NIGHTTIME HOUR:	2	3
	LDN:	62	63
	COMBINED TOTAL LDN:	65	66

APPENDIX E: AIR QUALITY ANALYSIS

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: H:\AQ-GHG Models\Pittsburg\Construction Phase 1.urb924

Project Name: Pittsburg - Bay Point BART Master Plan - Phase 1 Construction

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2011 TOTALS (lbs/day unmitigated)	7.96	53.88	55.72	0.05	50.01	2.94	52.87	10.47	2.70	13.10	8,866.69
2012 TOTALS (lbs/day unmitigated)	6.99	40.54	50.32	0.05	0.20	2.71	2.92	0.07	2.49	2.56	7,660.68
2013 TOTALS (lbs/day unmitigated)	6.45	37.64	47.59	0.05	0.20	2.47	2.67	0.07	2.26	2.34	7,662.11
2014 TOTALS (lbs/day unmitigated)	28.40	34.88	45.25	0.05	0.20	2.24	2.45	0.07	2.06	2.13	7,690.18
2015 TOTALS (lbs/day unmitigated)	22.44	0.01	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.76

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

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	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 3/30/2011-5/10/2011 Active Days: 30	3.00	25.62	13.71	0.00	49.82	1.25	51.07	10.41	1.15	11.56	2,686.96
Mass Grading 03/30/2011-05/11/2011	3.00	25.62	13.71	0.00	49.82	1.25	51.07	10.41	1.15	11.56	2,686.96
Mass Grading Dust	0.00	0.00	0.00	0.00	49.80	0.00	49.80	10.40	0.00	10.40	0.00
Mass Grading Off Road Diesel	2.83	23.44	11.96	0.00	0.00	1.17	1.17	0.00	1.08	1.08	2,247.32
Mass Grading On Road Diesel	0.14	2.12	0.69	0.00	0.01	0.08	0.09	0.00	0.07	0.07	337.67
Mass Grading Worker Trips	0.03	0.06	1.07	0.00	0.00	0.00	0.01	0.00	0.00	0.00	101.97
Time Slice 5/11/2011-5/11/2011 Active Days: 1	7.96	**53.88**	**55.72**	**0.05**	**50.01**	2.86	**52.87**	**10.47**	2.62	**13.10**	**8,866.69**
Building 05/11/2011-05/11/2014	4.96	28.26	42.01	0.04	0.19	1.61	1.80	0.07	1.47	1.54	6,179.73
Building Off Road Diesel	3.39	15.67	10.85	0.00	0.00	1.14	1.14	0.00	1.05	1.05	1,621.20
Building Vendor Trips	0.83	11.31	8.10	0.02	0.09	0.42	0.50	0.03	0.38	0.41	2,361.50
Building Worker Trips	0.75	1.28	23.06	0.02	0.11	0.06	0.16	0.04	0.05	0.08	2,197.03
Mass Grading 03/30/2011-05/11/2011	3.00	25.62	13.71	0.00	49.82	1.25	51.07	10.41	1.15	11.56	2,686.96
Mass Grading Dust	0.00	0.00	0.00	0.00	49.80	0.00	49.80	10.40	0.00	10.40	0.00
Mass Grading Off Road Diesel	2.83	23.44	11.96	0.00	0.00	1.17	1.17	0.00	1.08	1.08	2,247.32
Mass Grading On Road Diesel	0.14	2.12	0.69	0.00	0.01	0.08	0.09	0.00	0.07	0.07	337.67
Mass Grading Worker Trips	0.03	0.06	1.07	0.00	0.00	0.00	0.01	0.00	0.00	0.00	101.97

Time Slice 5/12/2011-12/30/2011 Active Days: 167	7.52	43.55	53.23	0.05	0.20	2.94	3.15	0.07	2.70	2.77	7,659.22
Asphalt 05/12/2011-08/11/2014	2.56	15.29	11.22	0.00	0.01	1.33	1.34	0.00	1.22	1.23	1,479.49
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.48	15.15	9.07	0.00	0.00	1.33	1.33	0.00	1.22	1.22	1,272.04
Paving On Road Diesel	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.50
Paving Worker Trips	0.07	0.12	2.14	0.00	0.01	0.01	0.02	0.00	0.00	0.01	203.95
Building 05/11/2011-05/11/2014	4.96	28.26	42.01	0.04	0.19	1.61	1.80	0.07	1.47	1.54	6,179.73
Building Off Road Diesel	3.39	15.67	10.85	0.00	0.00	1.14	1.14	0.00	1.05	1.05	1,621.20
Building Vendor Trips	0.83	11.31	8.10	0.02	0.09	0.42	0.50	0.03	0.38	0.41	2,361.50
Building Worker Trips	0.75	1.28	23.06	0.02	0.11	0.06	0.16	0.04	0.05	0.08	2,197.03
Time Slice 1/2/2012-12/31/2012 Active Days: 261	6.99	40.54	50.32	0.05	0.20	2.71	2.92	0.07	2.49	2.56	7,660.68
Asphalt 05/12/2011-08/11/2014	2.41	14.48	10.97	0.00	0.01	1.25	1.26	0.00	1.15	1.15	1,479.61
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.34	14.35	8.99	0.00	0.00	1.24	1.24	0.00	1.14	1.14	1,272.04
Paving On Road Diesel	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.50
Paving Worker Trips	0.06	0.11	1.97	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.07
Building 05/11/2011-05/11/2014	4.58	26.06	39.35	0.04	0.19	1.47	1.66	0.07	1.34	1.41	6,181.06
Building Off Road Diesel	3.14	14.81	10.52	0.00	0.00	1.04	1.04	0.00	0.95	0.95	1,621.20
Building Vendor Trips	0.77	10.08	7.56	0.02	0.09	0.37	0.46	0.03	0.34	0.37	2,361.52
Building Worker Trips	0.68	1.16	21.27	0.02	0.11	0.06	0.16	0.04	0.05	0.08	2,198.34

Time Slice 1/1/2013-12/31/2013 Active Days: 261	6.45	37.64	47.59	0.05	0.20	2.47	2.67	0.07	2.26	2.34	7,662.11
Asphalt 05/12/2011-08/11/2014	2.26	13.72	10.74	0.00	0.01	1.15	1.16	0.00	1.06	1.06	1,479.73
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.19	13.60	8.91	0.00	0.00	1.15	1.15	0.00	1.05	1.05	1,272.04
Paving On Road Diesel	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.50
Paving Worker Trips	0.06	0.10	1.82	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.19
Building 05/11/2011-05/11/2014	4.19	23.92	36.85	0.04	0.19	1.32	1.51	0.07	1.21	1.27	6,182.38
Building Off Road Diesel	2.88	13.91	10.20	0.00	0.00	0.93	0.93	0.00	0.86	0.86	1,621.20
Building Vendor Trips	0.71	8.96	7.05	0.02	0.09	0.33	0.42	0.03	0.30	0.33	2,361.61
Building Worker Trips	0.61	1.06	19.60	0.02	0.11	0.06	0.16	0.04	0.05	0.08	2,199.58
Time Slice 1/1/2014-5/7/2014 Active Days: 91	5.96	34.87	45.03	0.05	0.20	2.24	2.45	0.07	2.05	2.13	7,663.44
Asphalt 05/12/2011-08/11/2014	2.12	12.99	10.53	0.00	0.01	1.07	1.08	0.00	0.98	0.98	1,479.83
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.06	12.89	8.85	0.00	0.00	1.06	1.06	0.00	0.98	0.98	1,272.04
Paving On Road Diesel	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.50
Paving Worker Trips	0.05	0.09	1.68	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.29
Building 05/11/2011-05/11/2014	3.84	21.88	34.50	0.04	0.19	1.18	1.37	0.07	1.07	1.14	6,183.61
Building Off Road Diesel	2.63	12.97	9.89	0.00	0.00	0.82	0.82	0.00	0.76	0.76	1,621.20
Building Vendor Trips	0.65	7.94	6.57	0.02	0.09	0.30	0.38	0.03	0.27	0.30	2,361.73
Building Worker Trips	0.55	0.96	18.05	0.02	0.11	0.06	0.16	0.04	0.05	0.08	2,200.68

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Time Slice 5/8/2014-5/9/2014 Active Days: 2	28.40	34.88	45.25	0.05	0.20	2.24	2.45	0.07	2.06	2.13	7,690.18
Asphalt 05/12/2011-08/11/2014	2.12	12.99	10.53	0.00	0.01	1.07	1.08	0.00	0.98	0.98	1,479.83
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.06	12.89	8.85	0.00	0.00	1.06	1.06	0.00	0.98	0.98	1,272.04
Paving On Road Diesel	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.50
Paving Worker Trips	0.05	0.09	1.68	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.29
Building 05/11/2011-05/11/2014	3.84	21.88	34.50	0.04	0.19	1.18	1.37	0.07	1.07	1.14	6,183.61
Building Off Road Diesel	2.63	12.97	9.89	0.00	0.00	0.82	0.82	0.00	0.76	0.76	1,621.20
Building Vendor Trips	0.65	7.94	6.57	0.02	0.09	0.30	0.38	0.03	0.27	0.30	2,361.73
Building Worker Trips	0.55	0.96	18.05	0.02	0.11	0.06	0.16	0.04	0.05	0.08	2,200.68
Coating 05/08/2014-06/05/2015	22.44	0.01	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.74
Architectural Coating	22.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.01	0.01	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.74
Time Slice 5/12/2014-8/11/2014 Active Days: 66	24.56	13.00	10.75	0.00	0.01	1.07	1.08	0.00	0.98	0.98	1,506.57
Asphalt 05/12/2011-08/11/2014	2.12	12.99	10.53	0.00	0.01	1.07	1.08	0.00	0.98	0.98	1,479.83
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.06	12.89	8.85	0.00	0.00	1.06	1.06	0.00	0.98	0.98	1,272.04
Paving On Road Diesel	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.50
Paving Worker Trips	0.05	0.09	1.68	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.29
Coating 05/08/2014-06/05/2015	22.44	0.01	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.74
Architectural Coating	22.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.01	0.01	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.74

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Time Slice 8/12/2014-12/31/2014 Active Days: 102	22.44	0.01	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.74
Coating 05/08/2014-06/05/2015	22.44	0.01	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.74
Architectural Coating	22.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.01	0.01	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.74
Time Slice 1/1/2015-6/5/2015 Active Days: 112	22.44	0.01	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.76
Coating 05/08/2014-06/05/2015	22.44	0.01	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.76
Architectural Coating	22.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.01	0.01	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.76

Phase Assumptions

Phase: Mass Grading 3/30/2011 - 5/11/2011 - Default Fine Site Grading Description

Total Acres Disturbed: 9.95

Maximum Daily Acreage Disturbed: 2.49

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 83.87

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 5/12/2011 - 8/11/2014 - Default Paving Description

Acres to be Paved: 2.49

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 5/11/2011 - 5/11/2014 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 5/8/2014 - 6/5/2015 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: H:\AQ-GHG Models\Pittsburg\Construction Phase 2.urb924

Project Name: Pittsburg - Bay Point BART Master Plan - Phase 2 Construction

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2015 TOTALS (lbs/day unmitigated)	3.83	27.84	19.67	0.01	0.83	1.57	2.39	0.18	1.44	1.62	3,845.29
2016 TOTALS (lbs/day unmitigated)	2.14	13.93	12.46	0.00	0.01	0.93	0.94	0.00	0.85	0.86	2,102.70
2017 TOTALS (lbs/day unmitigated)	1.99	12.86	12.26	0.00	0.01	0.84	0.85	0.00	0.77	0.78	2,102.75
2018 TOTALS (lbs/day unmitigated)	3.79	11.84	12.07	0.00	0.01	0.75	0.76	0.00	0.69	0.69	2,102.78

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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Time Slice 4/30/2015-5/27/2015 Active Days: 20	2.38	18.86	11.63	0.00	0.82	0.86	1.67	0.17	0.79	0.96	2,687.17
Fine Grading 04/30/2015-06/11/2015	2.38	18.86	11.63	0.00	0.82	0.86	1.67	0.17	0.79	0.96	2,687.17
Fine Grading Dust	0.00	0.00	0.00	0.00	0.80	0.00	0.80	0.17	0.00	0.17	0.00
Fine Grading Off Road Diesel	2.26	17.50	10.40	0.00	0.00	0.81	0.81	0.00	0.74	0.74	2,247.32
Fine Grading On Road Diesel	0.10	1.31	0.46	0.00	0.01	0.05	0.06	0.00	0.04	0.05	337.67
Fine Grading Worker Trips	0.02	0.04	0.77	0.00	0.00	0.00	0.01	0.00	0.00	0.00	102.18
Time Slice 5/28/2015-6/11/2015 Active Days: 11	**3.83**	**27.84**	**19.67**	**0.01**	**0.83**	**1.57**	**2.39**	**0.18**	**1.44**	**1.62**	**3,845.29**
Asphalt 05/28/2015-01/11/2018	1.45	8.99	8.04	0.00	0.01	0.71	0.72	0.00	0.65	0.66	1,158.12
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.41	8.91	6.69	0.00	0.00	0.71	0.71	0.00	0.65	0.65	979.23
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Paving Worker Trips	0.04	0.07	1.35	0.00	0.01	0.00	0.01	0.00	0.00	0.01	178.82
Fine Grading 04/30/2015-06/11/2015	2.38	18.86	11.63	0.00	0.82	0.86	1.67	0.17	0.79	0.96	2,687.17
Fine Grading Dust	0.00	0.00	0.00	0.00	0.80	0.00	0.80	0.17	0.00	0.17	0.00
Fine Grading Off Road Diesel	2.26	17.50	10.40	0.00	0.00	0.81	0.81	0.00	0.74	0.74	2,247.32
Fine Grading On Road Diesel	0.10	1.31	0.46	0.00	0.01	0.05	0.06	0.00	0.04	0.05	337.67
Fine Grading Worker Trips	0.02	0.04	0.77	0.00	0.00	0.00	0.01	0.00	0.00	0.00	102.18

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Time Slice 6/12/2015-12/31/2015 Active Days: 145	1.45	8.99	8.04	0.00	0.01	0.71	0.72	0.00	0.65	0.66	1,158.12
Asphalt 05/28/2015-01/11/2018	1.45	8.99	8.04	0.00	0.01	0.71	0.72	0.00	0.65	0.66	1,158.12
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.41	8.91	6.69	0.00	0.00	0.71	0.71	0.00	0.65	0.65	979.23
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Paving Worker Trips	0.04	0.07	1.35	0.00	0.01	0.00	0.01	0.00	0.00	0.01	178.82
Time Slice 1/1/2016-1/8/2016 Active Days: 6	1.36	8.39	7.89	0.00	0.01	0.64	0.64	0.00	0.58	0.59	1,158.17
Asphalt 05/28/2015-01/11/2018	1.36	8.39	7.89	0.00	0.01	0.64	0.64	0.00	0.58	0.59	1,158.17
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.32	8.33	6.64	0.00	0.00	0.63	0.63	0.00	0.58	0.58	979.23
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Paving Worker Trips	0.04	0.07	1.25	0.00	0.01	0.00	0.01	0.00	0.00	0.01	178.87
Time Slice 1/11/2016-12/30/2016 Active Days: 255	2.14	13.93	12.46	0.00	0.01	0.93	0.94	0.00	0.85	0.86	2,102.70
Asphalt 05/28/2015-01/11/2018	1.36	8.39	7.89	0.00	0.01	0.64	0.64	0.00	0.58	0.59	1,158.17
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.32	8.33	6.64	0.00	0.00	0.63	0.63	0.00	0.58	0.58	979.23
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Paving Worker Trips	0.04	0.07	1.25	0.00	0.01	0.00	0.01	0.00	0.00	0.01	178.87
Building 01/11/2016-05/22/2018	0.78	5.53	4.57	0.00	0.00	0.29	0.29	0.00	0.27	0.27	944.53
Building Off Road Diesel	0.77	5.49	4.26	0.00	0.00	0.29	0.29	0.00	0.27	0.27	893.39
Building Vendor Trips	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.13
Building Worker Trips	0.01	0.01	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.02

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Time Slice 1/2/2017-12/29/2017 Active Days: 260	1.99	12.86	12.26	0.00	0.01	0.84	0.85	0.00	0.77	0.78	2,102.75
Asphalt 05/28/2015-01/11/2018	1.27	7.85	7.76	0.00	0.01	0.58	0.59	0.00	0.53	0.54	1,158.21
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.24	7.79	6.61	0.00	0.00	0.58	0.58	0.00	0.53	0.53	979.23
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Paving Worker Trips	0.03	0.06	1.15	0.00	0.01	0.00	0.01	0.00	0.00	0.01	178.91
Building 01/11/2016-05/22/2018	0.72	5.00	4.50	0.00	0.00	0.26	0.26	0.00	0.24	0.24	944.54
Building Off Road Diesel	0.71	4.97	4.22	0.00	0.00	0.26	0.26	0.00	0.24	0.24	893.39
Building Vendor Trips	0.00	0.02	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.13
Building Worker Trips	0.01	0.01	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.02
Time Slice 1/1/2018-1/11/2018 Active Days: 9	1.85	11.84	12.07	0.00	0.01	0.75	0.76	0.00	0.69	0.69	2,102.78
Asphalt 05/28/2015-01/11/2018	1.19	7.34	7.65	0.00	0.01	0.53	0.54	0.00	0.49	0.49	1,158.24
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.16	7.29	6.58	0.00	0.00	0.52	0.52	0.00	0.48	0.48	979.23
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07
Paving Worker Trips	0.03	0.05	1.07	0.00	0.01	0.00	0.01	0.00	0.00	0.01	178.94
Building 01/11/2016-05/22/2018	0.66	4.50	4.43	0.00	0.00	0.22	0.23	0.00	0.21	0.21	944.55
Building Off Road Diesel	0.65	4.47	4.16	0.00	0.00	0.22	0.22	0.00	0.20	0.20	893.39
Building Vendor Trips	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.13
Building Worker Trips	0.01	0.01	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.03

Time Slice 1/12/2018-4/6/2018 Active Days: 61	0.66	4.50	4.43	0.00	0.00	0.22	0.23	0.00	0.21	0.21	944.55
Building 01/11/2016-05/22/2018	0.66	4.50	4.43	0.00	0.00	0.22	0.23	0.00	0.21	0.21	944.55
Building Off Road Diesel	0.65	4.47	4.16	0.00	0.00	0.22	0.22	0.00	0.20	0.20	893.39
Building Vendor Trips	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.13
Building Worker Trips	0.01	0.01	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.03
Time Slice 4/9/2018-5/22/2018 Active Days: 32	3.79	4.50	4.45	0.00	0.00	0.22	0.23	0.00	0.21	0.21	948.27
Building 01/11/2016-05/22/2018	0.66	4.50	4.43	0.00	0.00	0.22	0.23	0.00	0.21	0.21	944.55
Building Off Road Diesel	0.65	4.47	4.16	0.00	0.00	0.22	0.22	0.00	0.20	0.20	893.39
Building Vendor Trips	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.13
Building Worker Trips	0.01	0.01	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.03
Coating 04/08/2018-06/05/2018	3.12	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.73
Architectural Coating	3.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.73
Time Slice 5/23/2018-6/5/2018 Active Days: 10	3.12	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.73
Coating 04/08/2018-06/05/2018	3.12	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.73
Architectural Coating	3.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.73

Phase Assumptions

Phase: Fine Grading 4/30/2015 - 6/11/2015 - Default Fine Site Grading Description

Total Acres Disturbed: 0.18

Maximum Daily Acreage Disturbed: 0.04

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

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On Road Truck Travel (VMT): 83.87

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 5/28/2015 - 1/11/2018 - Default Paving Description

Acres to be Paved: 0.04

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 1/11/2016 - 5/22/2018 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Architectural Coating 4/8/2018 - 6/5/2018 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: H:\AQ-GHG Models\Pittsburg\Construction Phase 3.urb924

Project Name: Pittsburg - Bay Point BART Master Plan - Phase 3 Construction

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2018 TOTALS (lbs/day unmitigated)	3.73	21.16	27.01	0.02	31.62	1.34	32.25	6.61	1.23	7.19	4,826.29
2019 TOTALS (lbs/day unmitigated)	3.43	19.68	26.12	0.02	0.09	1.19	1.28	0.03	1.09	1.12	4,826.53
2020 TOTALS (lbs/day unmitigated)	3.14	18.37	25.31	0.02	0.09	1.08	1.17	0.03	0.99	1.02	4,826.75
2021 TOTALS (lbs/day unmitigated)	3.04	17.94	22.91	0.02	0.09	1.07	1.16	0.03	0.98	1.01	4,827.78
2022 TOTALS (lbs/day unmitigated)	53.26	17.94	22.91	0.02	0.09	1.07	1.16	0.03	0.98	1.01	4,827.78

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

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	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 7/2/2018-8/10/2018 Active Days: 30	1.98	14.37	10.53	0.00	**31.62**	0.63	**32.25**	**6.61**	0.58	**7.19**	2,687.24
Fine Grading 06/30/2018-08/11/2018	1.98	14.37	10.53	0.00	31.62	0.63	32.25	6.61	0.58	7.19	2,687.24
Fine Grading Dust	0.00	0.00	0.00	0.00	31.60	0.00	31.60	6.60	0.00	6.60	0.00
Fine Grading Off Road Diesel	1.88	13.42	9.57	0.00	0.00	0.60	0.60	0.00	0.55	0.55	2,247.32
Fine Grading On Road Diesel	0.08	0.92	0.35	0.00	0.01	0.03	0.04	0.00	0.03	0.03	337.67
Fine Grading Worker Trips	0.02	0.03	0.61	0.00	0.00	0.00	0.01	0.00	0.00	0.00	102.25
Time Slice 8/15/2018-9/10/2018 Active Days: 19	1.63	9.97	9.85	0.00	0.01	0.74	0.75	0.00	0.68	0.69	1,478.56
Asphalt 08/15/2018-03/11/2022	1.63	9.97	9.85	0.00	0.01	0.74	0.75	0.00	0.68	0.69	1,478.56
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.59	9.90	8.63	0.00	0.00	0.74	0.74	0.00	0.68	0.68	1,272.04
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.02
Paving Worker Trips	0.03	0.06	1.22	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.51

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Time Slice 9/11/2018-12/31/2018 Active Days: 80	3.73	21.16	27.01	0.02	0.09	1.34	1.43	0.03	1.23	1.26	4,826.29
Asphalt 08/15/2018-03/11/2022	1.63	9.97	9.85	0.00	0.01	0.74	0.75	0.00	0.68	0.69	1,478.56
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.59	9.90	8.63	0.00	0.00	0.74	0.74	0.00	0.68	0.68	1,272.04
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.02
Paving Worker Trips	0.03	0.06	1.22	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.51
Building 09/11/2018-05/22/2022	2.09	11.19	17.16	0.02	0.08	0.60	0.68	0.03	0.55	0.57	3,347.73
Building Off Road Diesel	1.78	9.66	9.01	0.00	0.00	0.52	0.52	0.00	0.48	0.48	1,621.20
Building Vendor Trips	0.12	1.18	1.31	0.01	0.02	0.05	0.07	0.01	0.04	0.05	578.03
Building Worker Trips	0.20	0.35	6.84	0.01	0.06	0.03	0.09	0.02	0.02	0.04	1,148.50
Time Slice 1/1/2019-12/31/2019 Active Days: 261	3.43	19.68	26.12	0.02	0.09	1.19	1.28	0.03	1.09	1.12	4,826.53
Asphalt 08/15/2018-03/11/2022	1.52	9.34	9.69	0.00	0.01	0.67	0.68	0.00	0.62	0.62	1,478.59
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.48	9.28	8.57	0.00	0.00	0.66	0.66	0.00	0.61	0.61	1,272.04
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.02
Paving Worker Trips	0.03	0.06	1.13	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.54
Building 09/11/2018-05/22/2022	1.91	10.34	16.42	0.02	0.08	0.52	0.60	0.03	0.48	0.50	3,347.94
Building Off Road Diesel	1.62	8.96	8.86	0.00	0.00	0.45	0.45	0.00	0.41	0.41	1,621.20
Building Vendor Trips	0.11	1.06	1.23	0.01	0.02	0.04	0.06	0.01	0.04	0.05	578.07
Building Worker Trips	0.18	0.32	6.33	0.01	0.06	0.03	0.09	0.02	0.02	0.04	1,148.68

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Time Slice 1/1/2020-12/31/2020 Active Days: 262	3.14	18.37	25.31	0.02	0.09	1.08	1.17	0.03	0.99	1.02	4,826.75
Asphalt 08/15/2018-03/11/2022	1.42	8.76	9.58	0.00	0.01	0.62	0.63	0.00	0.57	0.58	1,478.62
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.38	8.70	8.54	0.00	0.00	0.62	0.62	0.00	0.57	0.57	1,272.04
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.02
Paving Worker Trips	0.03	0.05	1.04	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.56
Building 09/11/2018-05/22/2022	1.72	9.62	15.73	0.02	0.08	0.46	0.54	0.03	0.42	0.45	3,348.13
Building Off Road Diesel	1.46	8.36	8.72	0.00	0.00	0.39	0.39	0.00	0.36	0.36	1,621.20
Building Vendor Trips	0.10	0.96	1.16	0.01	0.02	0.04	0.06	0.01	0.04	0.04	578.10
Building Worker Trips	0.16	0.29	5.85	0.01	0.06	0.03	0.08	0.02	0.02	0.04	1,148.83
Time Slice 1/1/2021-12/31/2021 Active Days: 261	3.04	17.94	22.91	0.02	0.09	1.07	1.16	0.03	0.98	1.01	4,827.78
Asphalt 08/15/2018-03/11/2022	1.41	8.74	9.25	0.00	0.01	0.62	0.63	0.00	0.57	0.58	1,478.76
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.38	8.70	8.54	0.00	0.00	0.62	0.62	0.00	0.57	0.57	1,272.04
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.02
Paving Worker Trips	0.02	0.03	0.72	0.00	0.01	0.00	0.01	0.00	0.00	0.01	204.70
Building 09/11/2018-05/22/2022	1.64	9.20	13.65	0.02	0.08	0.45	0.53	0.03	0.41	0.44	3,349.02
Building Off Road Diesel	1.46	8.36	8.72	0.00	0.00	0.39	0.39	0.00	0.36	0.36	1,621.20
Building Vendor Trips	0.08	0.65	0.91	0.01	0.02	0.03	0.05	0.01	0.03	0.03	578.22
Building Worker Trips	0.10	0.19	4.02	0.01	0.06	0.03	0.08	0.02	0.02	0.04	1,149.60

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Time Slice 1/3/2022-3/11/2022 Active Days: 50	3.04	17.94	22.91	0.02	0.09	1.07	1.16	0.03	0.98	1.01	4,827.78
Asphalt 08/15/2018-03/11/2022	1.41	8.74	9.25	0.00	0.01	0.62	0.63	0.00	0.57	0.58	1,478.76
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.38	8.70	8.54	0.00	0.00	0.62	0.62	0.00	0.57	0.57	1,272.04
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.02
Paving Worker Trips	0.02	0.03	0.72	0.00	0.01	0.00	0.01	0.00	0.00	0.01	204.70
Building 09/11/2018-05/22/2022	1.64	9.20	13.65	0.02	0.08	0.45	0.53	0.03	0.41	0.44	3,349.02
Building Off Road Diesel	1.46	8.36	8.72	0.00	0.00	0.39	0.39	0.00	0.36	0.36	1,621.20
Building Vendor Trips	0.08	0.65	0.91	0.01	0.02	0.03	0.05	0.01	0.03	0.03	578.22
Building Worker Trips	0.10	0.19	4.02	0.01	0.06	0.03	0.08	0.02	0.02	0.04	1,149.60
Time Slice 3/14/2022-5/20/2022 Active Days: 50	1.64	9.20	13.65	0.02	0.08	0.45	0.53	0.03	0.41	0.44	3,349.02
Building 09/11/2018-05/22/2022	1.64	9.20	13.65	0.02	0.08	0.45	0.53	0.03	0.41	0.44	3,349.02
Building Off Road Diesel	1.46	8.36	8.72	0.00	0.00	0.39	0.39	0.00	0.36	0.36	1,621.20
Building Vendor Trips	0.08	0.65	0.91	0.01	0.02	0.03	0.05	0.01	0.03	0.03	578.22
Building Worker Trips	0.10	0.19	4.02	0.01	0.06	0.03	0.08	0.02	0.02	0.04	1,149.60
Time Slice 5/23/2022-8/30/2022 Active Days: 72	53.26	0.01	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	63.62
Coating 05/23/2022-08/30/2022	53.26	0.01	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	63.62
Architectural Coating	53.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.01	0.01	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	63.62

Phase Assumptions

Phase: Fine Grading 6/30/2018 - 8/11/2018 - Default Fine Site Grading Description

Total Acres Disturbed: 6.31

Maximum Daily Acreage Disturbed: 1.58

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 83.87

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 8/15/2018 - 3/11/2022 - Default Paving Description

Acres to be Paved: 1.58

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 9/11/2018 - 5/22/2022 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 5/23/2022 - 8/30/2022 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

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Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: H:\AQ-GHG Models\Pittsburg\Construction Phase WCHB.urb924

Project Name: Pittsburg - Bay Point BART Master Plan - Phase WCHB Construction

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

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Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2022 TOTALS (lbs/day unmitigated)	3.92	22.28	42.72	0.08	89.02	1.38	90.23	18.59	1.25	19.71	11,560.50
2022 TOTALS (lbs/day mitigated)	3.92	22.28	42.72	0.08	50.35	1.38	51.56	10.52	1.25	11.63	11,560.50
2023 TOTALS (lbs/day unmitigated)	3.92	22.28	42.72	0.08	0.38	1.38	1.76	0.14	1.25	1.39	11,560.50
2023 TOTALS (lbs/day mitigated)	3.92	22.28	42.72	0.08	0.38	1.38	1.76	0.14	1.25	1.39	11,560.50
2024 TOTALS (lbs/day unmitigated)	3.92	22.28	42.72	0.08	0.38	1.38	1.76	0.14	1.25	1.39	11,560.50
2024 TOTALS (lbs/day mitigated)	3.92	22.28	42.72	0.08	0.38	1.38	1.76	0.14	1.25	1.39	11,560.50
2025 TOTALS (lbs/day unmitigated)	42.47	22.29	42.88	0.08	0.38	1.38	1.77	0.14	1.25	1.39	11,606.55
2025 TOTALS (lbs/day mitigated)	42.47	22.29	42.88	0.08	0.38	1.38	1.77	0.14	1.25	1.39	11,606.55
2026 TOTALS (lbs/day unmitigated)	42.23	21.40	37.07	0.08	0.38	1.37	1.75	0.14	1.24	1.38	11,610.84
2026 TOTALS (lbs/day mitigated)	42.23	21.40	37.07	0.08	0.38	1.37	1.75	0.14	1.24	1.38	11,610.84

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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Time Slice 5/2/2022-7/27/2022 Active Days: 63	1.70	11.33	9.60	0.00	89.01	0.49	89.50	18.59	0.45	19.04	2,458.71
Mass Grading 05/01/2022-09/11/2022	1.70	11.33	9.60	0.00	89.01	0.49	89.50	18.59	0.45	19.04	2,458.71
Mass Grading Dust	0.00	0.00	0.00	0.00	89.00	0.00	89.00	18.59	0.00	18.59	0.00
Mass Grading Off Road Diesel	1.67	11.16	9.17	0.00	0.00	0.49	0.49	0.00	0.45	0.45	2,247.32
Mass Grading On Road Diesel	0.02	0.16	0.07	0.00	0.00	0.01	0.01	0.00	0.01	0.01	109.04
Mass Grading Worker Trips	0.01	0.02	0.36	0.00	0.00	0.00	0.01	0.00	0.00	0.00	102.35
Time Slice 7/28/2022-9/9/2022 Active Days: 32	3.31	21.23	19.95	0.00	**89.02**	1.21	**90.23**	**18.59**	1.11	**19.71**	4,113.33
Asphalt 07/28/2022-01/11/2026	1.61	9.90	10.36	0.00	0.01	0.72	0.73	0.00	0.66	0.66	1,654.62
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.57	9.85	9.55	0.00	0.00	0.71	0.71	0.00	0.65	0.65	1,418.44
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.89
Paving Worker Trips	0.02	0.04	0.80	0.00	0.01	0.01	0.02	0.00	0.00	0.01	230.29
Mass Grading 05/01/2022-09/11/2022	1.70	11.33	9.60	0.00	89.01	0.49	89.50	18.59	0.45	19.04	2,458.71
Mass Grading Dust	0.00	0.00	0.00	0.00	89.00	0.00	89.00	18.59	0.00	18.59	0.00
Mass Grading Off Road Diesel	1.67	11.16	9.17	0.00	0.00	0.49	0.49	0.00	0.45	0.45	2,247.32
Mass Grading On Road Diesel	0.02	0.16	0.07	0.00	0.00	0.01	0.01	0.00	0.01	0.01	109.04
Mass Grading Worker Trips	0.01	0.02	0.36	0.00	0.00	0.00	0.01	0.00	0.00	0.00	102.35

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Time Slice 9/12/2022-12/30/2022 Active Days: 80	3.92	22.28	42.72	0.08	0.38	1.38	1.76	0.14	1.25	1.39	11,560.50
Asphalt 07/28/2022-01/11/2026	1.61	9.90	10.36	0.00	0.01	0.72	0.73	0.00	0.66	0.66	1,654.62
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.57	9.85	9.55	0.00	0.00	0.71	0.71	0.00	0.65	0.65	1,418.44
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.89
Paving Worker Trips	0.02	0.04	0.80	0.00	0.01	0.01	0.02	0.00	0.00	0.01	230.29
Building 09/11/2022-04/22/2026	2.31	12.38	32.37	0.08	0.37	0.66	1.04	0.13	0.59	0.73	9,905.88
Building Off Road Diesel	1.46	8.36	8.72	0.00	0.00	0.39	0.39	0.00	0.36	0.36	1,621.20
Building Vendor Trips	0.37	3.10	4.38	0.03	0.10	0.14	0.24	0.03	0.13	0.16	2,772.50
Building Worker Trips	0.48	0.92	19.27	0.05	0.27	0.13	0.40	0.10	0.11	0.20	5,512.19
Time Slice 1/2/2023-12/29/2023 Active Days: 260	3.92	22.28	42.72	0.08	0.38	1.38	1.76	0.14	1.25	1.39	11,560.50
Asphalt 07/28/2022-01/11/2026	1.61	9.90	10.36	0.00	0.01	0.72	0.73	0.00	0.66	0.66	1,654.62
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.57	9.85	9.55	0.00	0.00	0.71	0.71	0.00	0.65	0.65	1,418.44
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.89
Paving Worker Trips	0.02	0.04	0.80	0.00	0.01	0.01	0.02	0.00	0.00	0.01	230.29
Building 09/11/2022-04/22/2026	2.31	12.38	32.37	0.08	0.37	0.66	1.04	0.13	0.59	0.73	9,905.88
Building Off Road Diesel	1.46	8.36	8.72	0.00	0.00	0.39	0.39	0.00	0.36	0.36	1,621.20
Building Vendor Trips	0.37	3.10	4.38	0.03	0.10	0.14	0.24	0.03	0.13	0.16	2,772.50
Building Worker Trips	0.48	0.92	19.27	0.05	0.27	0.13	0.40	0.10	0.11	0.20	5,512.19

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Time Slice 1/1/2024-12/31/2024 Active Days: 262	3.92	22.28	42.72	0.08	0.38	1.38	1.76	0.14	1.25	1.39	11,560.50
Asphalt 07/28/2022-01/11/2026	1.61	9.90	10.36	0.00	0.01	0.72	0.73	0.00	0.66	0.66	1,654.62
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.57	9.85	9.55	0.00	0.00	0.71	0.71	0.00	0.65	0.65	1,418.44
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.89
Paving Worker Trips	0.02	0.04	0.80	0.00	0.01	0.01	0.02	0.00	0.00	0.01	230.29
Building 09/11/2022-04/22/2026	2.31	12.38	32.37	0.08	0.37	0.66	1.04	0.13	0.59	0.73	9,905.88
Building Off Road Diesel	1.46	8.36	8.72	0.00	0.00	0.39	0.39	0.00	0.36	0.36	1,621.20
Building Vendor Trips	0.37	3.10	4.38	0.03	0.10	0.14	0.24	0.03	0.13	0.16	2,772.50
Building Worker Trips	0.48	0.92	19.27	0.05	0.27	0.13	0.40	0.10	0.11	0.20	5,512.19
Time Slice 1/1/2025-1/7/2025 Active Days: 5	3.92	22.28	42.72	0.08	0.38	1.38	1.76	0.14	1.25	1.39	11,560.50
Asphalt 07/28/2022-01/11/2026	1.61	9.90	10.36	0.00	0.01	0.72	0.73	0.00	0.66	0.66	1,654.62
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.57	9.85	9.55	0.00	0.00	0.71	0.71	0.00	0.65	0.65	1,418.44
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.89
Paving Worker Trips	0.02	0.04	0.80	0.00	0.01	0.01	0.02	0.00	0.00	0.01	230.29
Building 09/11/2022-04/22/2026	2.31	12.38	32.37	0.08	0.37	0.66	1.04	0.13	0.59	0.73	9,905.88
Building Off Road Diesel	1.46	8.36	8.72	0.00	0.00	0.39	0.39	0.00	0.36	0.36	1,621.20
Building Vendor Trips	0.37	3.10	4.38	0.03	0.10	0.14	0.24	0.03	0.13	0.16	2,772.50
Building Worker Trips	0.48	0.92	19.27	0.05	0.27	0.13	0.40	0.10	0.11	0.20	5,512.19

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Time Slice 1/8/2025-12/31/2025 Active Days: 256	42.47	22.29	42.88	0.08	0.38	1.38	1.77	0.14	1.25	1.39	11,606.55
Asphalt 07/28/2022-01/11/2026	1.61	9.90	10.36	0.00	0.01	0.72	0.73	0.00	0.66	0.66	1,654.62
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.57	9.85	9.55	0.00	0.00	0.71	0.71	0.00	0.65	0.65	1,418.44
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.89
Paving Worker Trips	0.02	0.04	0.80	0.00	0.01	0.01	0.02	0.00	0.00	0.01	230.29
Building 09/11/2022-04/22/2026	2.31	12.38	32.37	0.08	0.37	0.66	1.04	0.13	0.59	0.73	9,905.88
Building Off Road Diesel	1.46	8.36	8.72	0.00	0.00	0.39	0.39	0.00	0.36	0.36	1,621.20
Building Vendor Trips	0.37	3.10	4.38	0.03	0.10	0.14	0.24	0.03	0.13	0.16	2,772.50
Building Worker Trips	0.48	0.92	19.27	0.05	0.27	0.13	0.40	0.10	0.11	0.20	5,512.19
Coating 01/08/2025-11/05/2026	38.55	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.04
Architectural Coating	38.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.04

Time Slice 1/1/2026-1/9/2026 Active Days: 7	42.23	21.40	37.07	0.08	0.38	1.37	1.75	0.14	1.24	1.38	11,610.84
Asphalt 07/28/2022-01/11/2026	1.60	9.89	10.15	0.00	0.01	0.72	0.73	0.00	0.66	0.66	1,654.78
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.57	9.85	9.55	0.00	0.00	0.71	0.71	0.00	0.65	0.65	1,418.44
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.89
Paving Worker Trips	0.01	0.03	0.60	0.00	0.01	0.01	0.02	0.00	0.00	0.01	230.45
Building 09/11/2022-04/22/2026	2.08	11.50	26.80	0.08	0.37	0.65	1.02	0.13	0.58	0.71	9,909.98
Building Off Road Diesel	1.46	8.36	8.72	0.00	0.00	0.39	0.39	0.00	0.36	0.36	1,621.20
Building Vendor Trips	0.32	2.50	3.76	0.03	0.10	0.12	0.22	0.03	0.11	0.14	2,772.82
Building Worker Trips	0.31	0.64	14.32	0.05	0.27	0.14	0.41	0.10	0.11	0.21	5,515.97
Coating 01/08/2025-11/05/2026	38.55	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.07
Architectural Coating	38.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.07
Time Slice 1/12/2026-4/22/2026 Active Days: 73	40.63	11.51	26.92	0.08	0.37	0.65	1.03	0.13	0.58	0.72	9,956.06
Building 09/11/2022-04/22/2026	2.08	11.50	26.80	0.08	0.37	0.65	1.02	0.13	0.58	0.71	9,909.98
Building Off Road Diesel	1.46	8.36	8.72	0.00	0.00	0.39	0.39	0.00	0.36	0.36	1,621.20
Building Vendor Trips	0.32	2.50	3.76	0.03	0.10	0.12	0.22	0.03	0.11	0.14	2,772.82
Building Worker Trips	0.31	0.64	14.32	0.05	0.27	0.14	0.41	0.10	0.11	0.21	5,515.97
Coating 01/08/2025-11/05/2026	38.55	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.07
Architectural Coating	38.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.07

Time Slice 4/23/2026-11/5/2026 Active Days: 141	38.55	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.07
Coating 01/08/2025-11/05/2026	38.55	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.07
Architectural Coating	38.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.07

Phase Assumptions

Phase: Mass Grading 5/1/2022 - 9/11/2022 - Default Fine Site Grading Description

Total Acres Disturbed: 17.8

Maximum Daily Acreage Disturbed: 4.45

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 27.08

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 7/28/2022 - 1/11/2026 - Default Paving Description

Acres to be Paved: 4.45

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

2 Paving Equipment (104 hp) operating at a 0.53 load factor for 6 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 9/11/2022 - 4/22/2026 - Default Building Construction Description

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Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 1/8/2025 - 11/5/2026 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 5/2/2022-7/27/2022 Active Days: 63	1.70	11.33	9.60	0.00	50.34	0.49	50.83	10.51	0.45	10.97	2,458.71
Mass Grading 05/01/2022-09/11/2022	1.70	11.33	9.60	0.00	50.34	0.49	50.83	10.51	0.45	10.97	2,458.71
Mass Grading Dust	0.00	0.00	0.00	0.00	50.33	0.00	50.33	10.51	0.00	10.51	0.00
Mass Grading Off Road Diesel	1.67	11.16	9.17	0.00	0.00	0.49	0.49	0.00	0.45	0.45	2,247.32
Mass Grading On Road Diesel	0.02	0.16	0.07	0.00	0.00	0.01	0.01	0.00	0.01	0.01	109.04
Mass Grading Worker Trips	0.01	0.02	0.36	0.00	0.00	0.00	0.01	0.00	0.00	0.00	102.35

Time Slice 7/28/2022-9/9/2022 Active Days: 32	3.31	21.23	19.95	0.00	50.35	1.21	51.56	10.52	1.11	11.63	4,113.33
Asphalt 07/28/2022-01/11/2026	1.61	9.90	10.36	0.00	0.01	0.72	0.73	0.00	0.66	0.66	1,654.62
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.57	9.85	9.55	0.00	0.00	0.71	0.71	0.00	0.65	0.65	1,418.44
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.89
Paving Worker Trips	0.02	0.04	0.80	0.00	0.01	0.01	0.02	0.00	0.00	0.01	230.29
Mass Grading 05/01/2022-09/11/2022	1.70	11.33	9.60	0.00	50.34	0.49	50.83	10.51	0.45	10.97	2,458.71
Mass Grading Dust	0.00	0.00	0.00	0.00	50.33	0.00	50.33	10.51	0.00	10.51	0.00
Mass Grading Off Road Diesel	1.67	11.16	9.17	0.00	0.00	0.49	0.49	0.00	0.45	0.45	2,247.32
Mass Grading On Road Diesel	0.02	0.16	0.07	0.00	0.00	0.01	0.01	0.00	0.01	0.01	109.04
Mass Grading Worker Trips	0.01	0.02	0.36	0.00	0.00	0.00	0.01	0.00	0.00	0.00	102.35
Time Slice 9/12/2022-12/30/2022 Active Days: 80	3.92	22.28	42.72	0.08	0.38	1.38	1.76	0.14	1.25	1.39	11,560.50
Asphalt 07/28/2022-01/11/2026	1.61	9.90	10.36	0.00	0.01	0.72	0.73	0.00	0.66	0.66	1,654.62
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.57	9.85	9.55	0.00	0.00	0.71	0.71	0.00	0.65	0.65	1,418.44
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.89
Paving Worker Trips	0.02	0.04	0.80	0.00	0.01	0.01	0.02	0.00	0.00	0.01	230.29
Building 09/11/2022-04/22/2026	2.31	12.38	32.37	0.08	0.37	0.66	1.04	0.13	0.59	0.73	9,905.88
Building Off Road Diesel	1.46	8.36	8.72	0.00	0.00	0.39	0.39	0.00	0.36	0.36	1,621.20
Building Vendor Trips	0.37	3.10	4.38	0.03	0.10	0.14	0.24	0.03	0.13	0.16	2,772.50
Building Worker Trips	0.48	0.92	19.27	0.05	0.27	0.13	0.40	0.10	0.11	0.20	5,512.19

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Time Slice 1/2/2023-12/29/2023 Active Days: 260	3.92	22.28	42.72	0.08	0.38	1.38	1.76	0.14	1.25	1.39	11,560.50
Asphalt 07/28/2022-01/11/2026	1.61	9.90	10.36	0.00	0.01	0.72	0.73	0.00	0.66	0.66	1,654.62
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.57	9.85	9.55	0.00	0.00	0.71	0.71	0.00	0.65	0.65	1,418.44
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.89
Paving Worker Trips	0.02	0.04	0.80	0.00	0.01	0.01	0.02	0.00	0.00	0.01	230.29
Building 09/11/2022-04/22/2026	2.31	12.38	32.37	0.08	0.37	0.66	1.04	0.13	0.59	0.73	9,905.88
Building Off Road Diesel	1.46	8.36	8.72	0.00	0.00	0.39	0.39	0.00	0.36	0.36	1,621.20
Building Vendor Trips	0.37	3.10	4.38	0.03	0.10	0.14	0.24	0.03	0.13	0.16	2,772.50
Building Worker Trips	0.48	0.92	19.27	0.05	0.27	0.13	0.40	0.10	0.11	0.20	5,512.19
Time Slice 1/1/2024-12/31/2024 Active Days: 262	3.92	22.28	42.72	0.08	0.38	1.38	1.76	0.14	1.25	1.39	11,560.50
Asphalt 07/28/2022-01/11/2026	1.61	9.90	10.36	0.00	0.01	0.72	0.73	0.00	0.66	0.66	1,654.62
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.57	9.85	9.55	0.00	0.00	0.71	0.71	0.00	0.65	0.65	1,418.44
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.89
Paving Worker Trips	0.02	0.04	0.80	0.00	0.01	0.01	0.02	0.00	0.00	0.01	230.29
Building 09/11/2022-04/22/2026	2.31	12.38	32.37	0.08	0.37	0.66	1.04	0.13	0.59	0.73	9,905.88
Building Off Road Diesel	1.46	8.36	8.72	0.00	0.00	0.39	0.39	0.00	0.36	0.36	1,621.20
Building Vendor Trips	0.37	3.10	4.38	0.03	0.10	0.14	0.24	0.03	0.13	0.16	2,772.50
Building Worker Trips	0.48	0.92	19.27	0.05	0.27	0.13	0.40	0.10	0.11	0.20	5,512.19

Time Slice 1/1/2025-1/7/2025 Active Days: 5	3.92	22.28	42.72	0.08	0.38	1.38	1.76	0.14	1.25	1.39	11,560.50
Asphalt 07/28/2022-01/11/2026	1.61	9.90	10.36	0.00	0.01	0.72	0.73	0.00	0.66	0.66	1,654.62
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.57	9.85	9.55	0.00	0.00	0.71	0.71	0.00	0.65	0.65	1,418.44
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.89
Paving Worker Trips	0.02	0.04	0.80	0.00	0.01	0.01	0.02	0.00	0.00	0.01	230.29
Building 09/11/2022-04/22/2026	2.31	12.38	32.37	0.08	0.37	0.66	1.04	0.13	0.59	0.73	9,905.88
Building Off Road Diesel	1.46	8.36	8.72	0.00	0.00	0.39	0.39	0.00	0.36	0.36	1,621.20
Building Vendor Trips	0.37	3.10	4.38	0.03	0.10	0.14	0.24	0.03	0.13	0.16	2,772.50
Building Worker Trips	0.48	0.92	19.27	0.05	0.27	0.13	0.40	0.10	0.11	0.20	5,512.19
Time Slice 1/8/2025-12/31/2025 Active Days: 256	**42.47**	**22.29**	**42.88**	**0.08**	0.38	**1.38**	1.77	0.14	**1.25**	1.39	11,606.55
Asphalt 07/28/2022-01/11/2026	1.61	9.90	10.36	0.00	0.01	0.72	0.73	0.00	0.66	0.66	1,654.62
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.57	9.85	9.55	0.00	0.00	0.71	0.71	0.00	0.65	0.65	1,418.44
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.89
Paving Worker Trips	0.02	0.04	0.80	0.00	0.01	0.01	0.02	0.00	0.00	0.01	230.29
Building 09/11/2022-04/22/2026	2.31	12.38	32.37	0.08	0.37	0.66	1.04	0.13	0.59	0.73	9,905.88
Building Off Road Diesel	1.46	8.36	8.72	0.00	0.00	0.39	0.39	0.00	0.36	0.36	1,621.20
Building Vendor Trips	0.37	3.10	4.38	0.03	0.10	0.14	0.24	0.03	0.13	0.16	2,772.50
Building Worker Trips	0.48	0.92	19.27	0.05	0.27	0.13	0.40	0.10	0.11	0.20	5,512.19
Coating 01/08/2025-11/05/2026	38.55	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.04
Architectural Coating	38.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.04

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Time Slice 1/1/2026-1/9/2026 Active Days: 7	42.23	21.40	37.07	0.08	0.38	1.37	1.75	0.14	1.24	1.38	11,610.84
Asphalt 07/28/2022-01/11/2026	1.60	9.89	10.15	0.00	0.01	0.72	0.73	0.00	0.66	0.66	1,654.78
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.57	9.85	9.55	0.00	0.00	0.71	0.71	0.00	0.65	0.65	1,418.44
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.89
Paving Worker Trips	0.01	0.03	0.60	0.00	0.01	0.01	0.02	0.00	0.00	0.01	230.45
Building 09/11/2022-04/22/2026	2.08	11.50	26.80	0.08	0.37	0.65	1.02	0.13	0.58	0.71	9,909.98
Building Off Road Diesel	1.46	8.36	8.72	0.00	0.00	0.39	0.39	0.00	0.36	0.36	1,621.20
Building Vendor Trips	0.32	2.50	3.76	0.03	0.10	0.12	0.22	0.03	0.11	0.14	2,772.82
Building Worker Trips	0.31	0.64	14.32	0.05	0.27	0.14	0.41	0.10	0.11	0.21	5,515.97
Coating 01/08/2025-11/05/2026	38.55	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.07
Architectural Coating	38.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.07
Time Slice 1/12/2026-4/22/2026 Active Days: 73	40.63	11.51	26.92	0.08	0.37	0.65	1.03	0.13	0.58	0.72	9,956.06
Building 09/11/2022-04/22/2026	2.08	11.50	26.80	0.08	0.37	0.65	1.02	0.13	0.58	0.71	9,909.98
Building Off Road Diesel	1.46	8.36	8.72	0.00	0.00	0.39	0.39	0.00	0.36	0.36	1,621.20
Building Vendor Trips	0.32	2.50	3.76	0.03	0.10	0.12	0.22	0.03	0.11	0.14	2,772.82
Building Worker Trips	0.31	0.64	14.32	0.05	0.27	0.14	0.41	0.10	0.11	0.21	5,515.97
Coating 01/08/2025-11/05/2026	38.55	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.07
Architectural Coating	38.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.07

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Time Slice 4/23/2026-11/5/2026 Active Days: 141	38.55	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.07
Coating 01/08/2025-11/05/2026	38.55	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.07
Architectural Coating	38.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.07

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 5/1/2022 - 9/11/2022 - Default Fine Site Grading Description

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: H:\AQ-GHG Models\Pittsburg\Construction Phase 4.urb924

Project Name: Pittsburg - Bay Point BART Master Plan - Phase 4 Construction

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2026 TOTALS (lbs/day unmitigated)	1.72	11.57	9.62	0.00	18.62	0.50	19.12	3.89	0.46	4.35	2,687.40
2027 TOTALS (lbs/day unmitigated)	1.66	10.34	13.20	0.01	0.05	0.63	0.68	0.02	0.58	0.59	2,974.43
2028 TOTALS (lbs/day unmitigated)	1.66	10.34	13.20	0.01	0.05	0.63	0.68	0.02	0.58	0.59	2,974.43
2029 TOTALS (lbs/day unmitigated)	35.17	10.34	13.20	0.01	0.05	0.63	0.68	0.02	0.58	0.59	2,974.43

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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Time Slice 9/30/2026-11/11/2026 Active Days: 31	1.72	**11.57**	9.62	0.00	**18.62**	0.50	**19.12**	**3.89**	0.46	**4.35**	2,687.40
Fine Grading 09/30/2026-11/11/2026	1.72	11.57	9.62	0.00	18.62	0.50	19.12	3.89	0.46	4.35	2,687.40
Fine Grading Dust	0.00	0.00	0.00	0.00	18.60	0.00	18.60	3.88	0.00	3.88	0.00
Fine Grading Off Road Diesel	1.67	11.16	9.17	0.00	0.00	0.49	0.49	0.00	0.45	0.45	2,247.32
Fine Grading On Road Diesel	0.05	0.41	0.19	0.00	0.01	0.01	0.03	0.00	0.01	0.02	337.67
Fine Grading Worker Trips	0.01	0.01	0.27	0.00	0.00	0.00	0.01	0.00	0.00	0.00	102.42
Time Slice 12/28/2026-12/31/2026 Active Days: 4	1.02	6.42	6.98	0.00	0.01	0.44	0.45	0.00	0.40	0.41	1,160.54
Asphalt 12/28/2026-01/11/2029	1.02	6.42	6.98	0.00	0.01	0.44	0.45	0.00	0.40	0.41	1,160.54
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.01	6.40	6.52	0.00	0.00	0.43	0.43	0.00	0.40	0.40	979.23
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.08
Paving Worker Trips	0.01	0.02	0.47	0.00	0.01	0.00	0.01	0.00	0.00	0.01	179.24
Time Slice 1/1/2027-1/8/2027 Active Days: 6	1.02	6.42	6.98	0.00	0.01	0.44	0.45	0.00	0.40	0.41	1,160.54
Asphalt 12/28/2026-01/11/2029	1.02	6.42	6.98	0.00	0.01	0.44	0.45	0.00	0.40	0.41	1,160.54
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.01	6.40	6.52	0.00	0.00	0.43	0.43	0.00	0.40	0.40	979.23
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.08
Paving Worker Trips	0.01	0.02	0.47	0.00	0.01	0.00	0.01	0.00	0.00	0.01	179.24

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Time Slice 1/11/2027-12/31/2027 Active Days: 255	1.66	10.34	**13.20**	**0.01**	0.05	**0.63**	0.68	0.02	**0.58**	0.59	**2,974.43**
Asphalt 12/28/2026-01/11/2029	1.02	6.42	6.98	0.00	0.01	0.44	0.45	0.00	0.40	0.41	1,160.54
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.01	6.40	6.52	0.00	0.00	0.43	0.43	0.00	0.40	0.40	979.23
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.08
Paving Worker Trips	0.01	0.02	0.47	0.00	0.01	0.00	0.01	0.00	0.00	0.01	179.24
Building 01/11/2027-08/22/2029	0.64	3.91	6.22	0.01	0.04	0.19	0.23	0.02	0.17	0.19	1,813.89
Building Off Road Diesel	0.57	3.63	4.10	0.00	0.00	0.16	0.16	0.00	0.15	0.15	893.39
Building Vendor Trips	0.03	0.20	0.32	0.00	0.01	0.01	0.02	0.00	0.01	0.01	227.52
Building Worker Trips	0.04	0.08	1.80	0.01	0.03	0.02	0.05	0.01	0.01	0.03	692.99
Time Slice 1/3/2028-12/29/2028 Active Days: 260	1.66	10.34	**13.20**	**0.01**	0.05	**0.63**	0.68	0.02	**0.58**	0.59	**2,974.43**
Asphalt 12/28/2026-01/11/2029	1.02	6.42	6.98	0.00	0.01	0.44	0.45	0.00	0.40	0.41	1,160.54
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.01	6.40	6.52	0.00	0.00	0.43	0.43	0.00	0.40	0.40	979.23
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.08
Paving Worker Trips	0.01	0.02	0.47	0.00	0.01	0.00	0.01	0.00	0.00	0.01	179.24
Building 01/11/2027-08/22/2029	0.64	3.91	6.22	0.01	0.04	0.19	0.23	0.02	0.17	0.19	1,813.89
Building Off Road Diesel	0.57	3.63	4.10	0.00	0.00	0.16	0.16	0.00	0.15	0.15	893.39
Building Vendor Trips	0.03	0.20	0.32	0.00	0.01	0.01	0.02	0.00	0.01	0.01	227.52
Building Worker Trips	0.04	0.08	1.80	0.01	0.03	0.02	0.05	0.01	0.01	0.03	692.99

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Time Slice 1/1/2029-1/11/2029 Active Days: 9	1.66	10.34	**13.20**	**0.01**	0.05	**0.63**	0.68	0.02	**0.58**	0.59	**2,974.43**
Asphalt 12/28/2026-01/11/2029	1.02	6.42	6.98	0.00	0.01	0.44	0.45	0.00	0.40	0.41	1,160.54
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.01	6.40	6.52	0.00	0.00	0.43	0.43	0.00	0.40	0.40	979.23
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.08
Paving Worker Trips	0.01	0.02	0.47	0.00	0.01	0.00	0.01	0.00	0.00	0.01	179.24
Building 01/11/2027-08/22/2029	0.64	3.91	6.22	0.01	0.04	0.19	0.23	0.02	0.17	0.19	1,813.89
Building Off Road Diesel	0.57	3.63	4.10	0.00	0.00	0.16	0.16	0.00	0.15	0.15	893.39
Building Vendor Trips	0.03	0.20	0.32	0.00	0.01	0.01	0.02	0.00	0.01	0.01	227.52
Building Worker Trips	0.04	0.08	1.80	0.01	0.03	0.02	0.05	0.01	0.01	0.03	692.99
Time Slice 1/12/2029-7/6/2029 Active Days: 126	0.64	3.91	6.22	0.01	0.04	0.19	0.23	0.02	0.17	0.19	1,813.89
Building 01/11/2027-08/22/2029	0.64	3.91	6.22	0.01	0.04	0.19	0.23	0.02	0.17	0.19	1,813.89
Building Off Road Diesel	0.57	3.63	4.10	0.00	0.00	0.16	0.16	0.00	0.15	0.15	893.39
Building Vendor Trips	0.03	0.20	0.32	0.00	0.01	0.01	0.02	0.00	0.01	0.01	227.52
Building Worker Trips	0.04	0.08	1.80	0.01	0.03	0.02	0.05	0.01	0.01	0.03	692.99
Time Slice 7/9/2029-8/22/2029 Active Days: 33	**35.17**	3.92	6.33	0.01	0.04	0.19	0.24	0.02	0.17	0.19	1,855.17
Building 01/11/2027-08/22/2029	0.64	3.91	6.22	0.01	0.04	0.19	0.23	0.02	0.17	0.19	1,813.89
Building Off Road Diesel	0.57	3.63	4.10	0.00	0.00	0.16	0.16	0.00	0.15	0.15	893.39
Building Vendor Trips	0.03	0.20	0.32	0.00	0.01	0.01	0.02	0.00	0.01	0.01	227.52
Building Worker Trips	0.04	0.08	1.80	0.01	0.03	0.02	0.05	0.01	0.01	0.03	692.99
Coating 07/08/2029-10/05/2029	34.53	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.28
Architectural Coating	34.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.28

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Time Slice 8/23/2029-10/5/2029 Active Days: 32	34.53	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.28
Coating 07/08/2029-10/05/2029	34.53	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.28
Architectural Coating	34.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.28

Phase Assumptions

Phase: Fine Grading 9/30/2026 - 11/11/2026 - Default Fine Site Grading Description

Total Acres Disturbed: 3.73

Maximum Daily Acreage Disturbed: 0.93

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 83.87

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 12/28/2026 - 1/11/2029 - Default Paving Description

Acres to be Paved: 0.93

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 1/11/2027 - 8/22/2029 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Architectural Coating 7/8/2029 - 10/5/2029 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: H:\AQ-GHG Models\Pittsburg\Construction Phase 5.urb924

Project Name: Pittsburg - Bay Point BART Master Plan - Phase 5 Construction

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2029 TOTALS (lbs/day unmitigated)	1.72	11.57	9.62	0.00	24.42	0.62	24.92	5.10	0.57	5.56	2,687.40
2030 TOTALS (lbs/day unmitigated)	3.04	18.10	22.16	0.02	0.10	1.09	1.19	0.04	1.00	1.03	5,250.52
2031 TOTALS (lbs/day unmitigated)	36.30	17.98	21.24	0.02	0.10	1.08	1.19	0.04	0.99	1.03	5,251.49

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

Time Slice 10/30/2029-12/11/2029 Active Days: 31	1.72	11.57	9.62	0.00	**24.42**	0.50	**24.92**	**5.10**	0.46	**5.56**	2,687.40
Fine Grading 10/30/2029-12/11/2029	1.72	11.57	9.62	0.00	24.42	0.50	24.92	5.10	0.46	5.56	2,687.40
Fine Grading Dust	0.00	0.00	0.00	0.00	24.40	0.00	24.40	5.10	0.00	5.10	0.00
Fine Grading Off Road Diesel	1.67	11.16	9.17	0.00	0.00	0.49	0.49	0.00	0.45	0.45	2,247.32
Fine Grading On Road Diesel	0.05	0.41	0.19	0.00	0.01	0.01	0.03	0.00	0.01	0.02	337.67
Fine Grading Worker Trips	0.01	0.01	0.27	0.00	0.00	0.00	0.01	0.00	0.00	0.00	102.42
Time Slice 12/28/2029-12/31/2029 Active Days: 2	1.41	8.73	9.07	0.00	0.01	0.62	0.63	0.00	0.57	0.58	1,482.25
Asphalt 12/28/2029-01/11/2031	1.41	8.73	9.07	0.00	0.01	0.62	0.63	0.00	0.57	0.58	1,482.25
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.38	8.70	8.54	0.00	0.00	0.62	0.62	0.00	0.57	0.57	1,272.04
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.37
Paving Worker Trips	0.01	0.02	0.53	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.84
Time Slice 1/1/2030-1/10/2030 Active Days: 8	1.41	8.73	9.07	0.00	0.01	0.62	0.63	0.00	0.57	0.58	1,482.25
Asphalt 12/28/2029-01/11/2031	1.41	8.73	9.07	0.00	0.01	0.62	0.63	0.00	0.57	0.58	1,482.25
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.38	8.70	8.54	0.00	0.00	0.62	0.62	0.00	0.57	0.57	1,272.04
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.37
Paving Worker Trips	0.01	0.02	0.53	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.84

Time Slice 1/11/2030-12/31/2030 Active Days: 253	3.04	**18.10**	**22.16**	**0.02**	0.10	**1.09**	1.19	0.04	**1.00**	1.03	5,250.52
Asphalt 12/28/2029-01/11/2031	1.41	8.73	9.07	0.00	0.01	0.62	0.63	0.00	0.57	0.58	1,482.25
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.38	8.70	8.54	0.00	0.00	0.62	0.62	0.00	0.57	0.57	1,272.04
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.37
Paving Worker Trips	0.01	0.02	0.53	0.00	0.01	0.01	0.02	0.00	0.00	0.01	204.84
Building 01/11/2030-05/22/2031	1.64	9.36	13.09	0.02	0.09	0.46	0.56	0.03	0.42	0.46	3,768.27
Building Off Road Diesel	1.46	8.36	8.72	0.00	0.00	0.39	0.39	0.00	0.36	0.36	1,621.20
Building Vendor Trips	0.11	0.86	1.21	0.01	0.03	0.04	0.07	0.01	0.04	0.05	931.80
Building Worker Trips	0.07	0.14	3.15	0.01	0.06	0.03	0.09	0.02	0.02	0.05	1,215.28
Time Slice 1/1/2031-1/10/2031 Active Days: 8	3.01	17.98	21.24	**0.02**	0.10	1.08	1.19	0.04	0.99	1.03	**5,251.49**
Asphalt 12/28/2029-01/11/2031	1.40	8.73	8.96	0.00	0.01	0.62	0.63	0.00	0.57	0.58	1,482.38
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.38	8.70	8.54	0.00	0.00	0.62	0.62	0.00	0.57	0.57	1,272.04
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.37
Paving Worker Trips	0.01	0.02	0.42	0.00	0.01	0.00	0.01	0.00	0.00	0.01	204.97
Building 01/11/2030-05/22/2031	1.60	9.25	12.28	0.02	0.09	0.46	0.55	0.03	0.42	0.45	3,769.11
Building Off Road Diesel	1.46	8.36	8.72	0.00	0.00	0.39	0.39	0.00	0.36	0.36	1,621.20
Building Vendor Trips	0.10	0.79	1.10	0.01	0.03	0.04	0.07	0.01	0.03	0.05	931.87
Building Worker Trips	0.05	0.10	2.47	0.01	0.06	0.03	0.09	0.02	0.02	0.04	1,216.04

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Time Slice 1/13/2031-4/7/2031 Active Days: 61	1.60	9.25	12.28	0.02	0.09	0.46	0.55	0.03	0.42	0.45	3,769.11
Building 01/11/2030-05/22/2031	1.60	9.25	12.28	0.02	0.09	0.46	0.55	0.03	0.42	0.45	3,769.11
Building Off Road Diesel	1.46	8.36	8.72	0.00	0.00	0.39	0.39	0.00	0.36	0.36	1,621.20
Building Vendor Trips	0.10	0.79	1.10	0.01	0.03	0.04	0.07	0.01	0.03	0.05	931.87
Building Worker Trips	0.05	0.10	2.47	0.01	0.06	0.03	0.09	0.02	0.02	0.04	1,216.04
Time Slice 4/8/2031-5/22/2031 Active Days: 33	**36.30**	9.25	12.37	0.02	0.10	0.46	0.56	0.03	0.42	0.45	3,810.61
Building 01/11/2030-05/22/2031	1.60	9.25	12.28	0.02	0.09	0.46	0.55	0.03	0.42	0.45	3,769.11
Building Off Road Diesel	1.46	8.36	8.72	0.00	0.00	0.39	0.39	0.00	0.36	0.36	1,621.20
Building Vendor Trips	0.10	0.79	1.10	0.01	0.03	0.04	0.07	0.01	0.03	0.05	931.87
Building Worker Trips	0.05	0.10	2.47	0.01	0.06	0.03	0.09	0.02	0.02	0.04	1,216.04
Coating 04/08/2031-09/05/2031	34.70	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.50
Architectural Coating	34.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.50
Time Slice 5/23/2031-9/5/2031 Active Days: 76	34.70	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.50
Coating 04/08/2031-09/05/2031	34.70	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.50
Architectural Coating	34.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.50

Phase Assumptions

Phase: Fine Grading 10/30/2029 - 12/11/2029 - Default Fine Site Grading Description

Total Acres Disturbed: 4.89

Maximum Daily Acreage Disturbed: 1.22

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

6/8/2011 12:05:40 PM

On Road Truck Travel (VMT): 83.87

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 12/28/2029 - 1/11/2031 - Default Paving Description

Acres to be Paved: 1.22

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Paving Equipment (104 hp) operating at a 0.53 load factor for 8 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 1/11/2030 - 5/22/2031 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 6 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Generator Sets (49 hp) operating at a 0.74 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

3 Welders (45 hp) operating at a 0.45 load factor for 8 hours per day

Phase: Architectural Coating 4/8/2031 - 9/5/2031 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

Project Name: Pittsburg - Bay Point BART Master Plan - Area Source Emissions - Build-out

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	PM10	PM2.5
TOTALS (tons/year, unmitigated)	19.00	2.29	3.91	3.76

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	PM10	PM2.5
TOTALS (tons/year, unmitigated)	19.00	2.29	3.91	3.76

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	PM10	PM2.5
Natural Gas	0.14	1.84	0.00	0.00
Hearth	6.77	0.44	3.91	3.76
Landscape	0.07	0.01	0.00	0.00
Consumer Products	10.43			
Architectural Coatings	1.59			
TOTALS (tons/year, unmitigated)	19.00	2.29	3.91	3.76

Area Source Changes to Defaults

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

Project Name: Pittsburg - Bay Point BART Master Plan - Operational Emissions - Build-out

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	PM10	PM2.5
TOTALS (tons/year, unmitigated)	22.01	25.85	33.62	6.46

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	PM10	PM2.5
TOTALS (tons/year, unmitigated)	22.01	25.85	33.62	6.46

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Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	PM10	PM25
Trips	22.01	25.85	33.62	6.46
TOTALS (tons/year, unmitigated)	22.01	25.85	33.62	6.46

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2012 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Trips		1,000.00	unknown	39.63	39,630.00	107,001.00
					39,630.00	107,001.00

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	53.8	0.7	99.1	0.2
Light Truck < 3750 lbs	12.8	1.6	95.3	3.1
Light Truck 3751-5750 lbs	19.8	0.5	99.5	0.0
Med Truck 5751-8500 lbs	6.6	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.9	0.0	77.8	22.2
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0

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Vehicle Fleet Mix

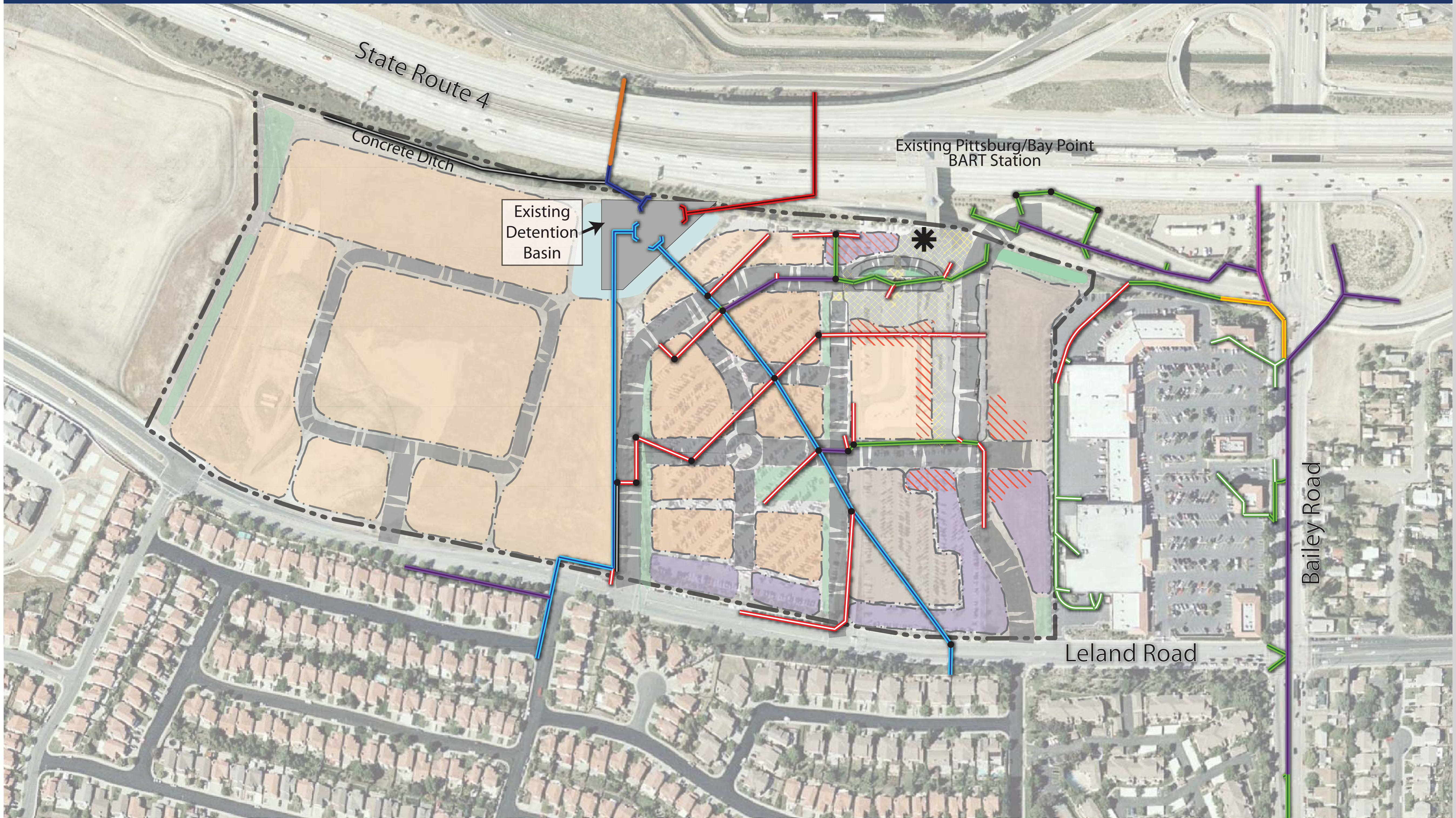
Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.4	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.2	59.4	40.6	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.6	0.0	83.3	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	2.7	2.7	2.7	2.7	2.7	2.7
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Trips				2.0	1.0	97.0

APPENDIX F: HYDROLOGY ANALYSIS

Figure X.X
Land Use Plan



legend

- 12" (or smaller) Existing Storm Drain Line
- 15" Existing Storm Drain Line
- 18" Existing Storm Drain Line
- 24" Existing Storm Drain Line
- 30" Existing Storm Drain Line
- 36" Existing Storm Drain Line
- 42" Existing Storm Drain Line
- 48" Existing Storm Drain Line
- 54" Existing Storm Drain Line
- 60" Existing Storm Drain Line
- Concrete Ditch
- BART Entrance

Boundaries

- Core Project Area

Land Uses

- Detention Basin
- Medium Density Residential
- High Density Residential
- Ground Floor Retail
- Flex*
- Parking
- Parks & Open Space
- Urban Plaza
- Roadways

* Flex space can be residential, retail, office, public or what the market dictates when the development starts to build out

200 100 0 200

Feet (approximate)

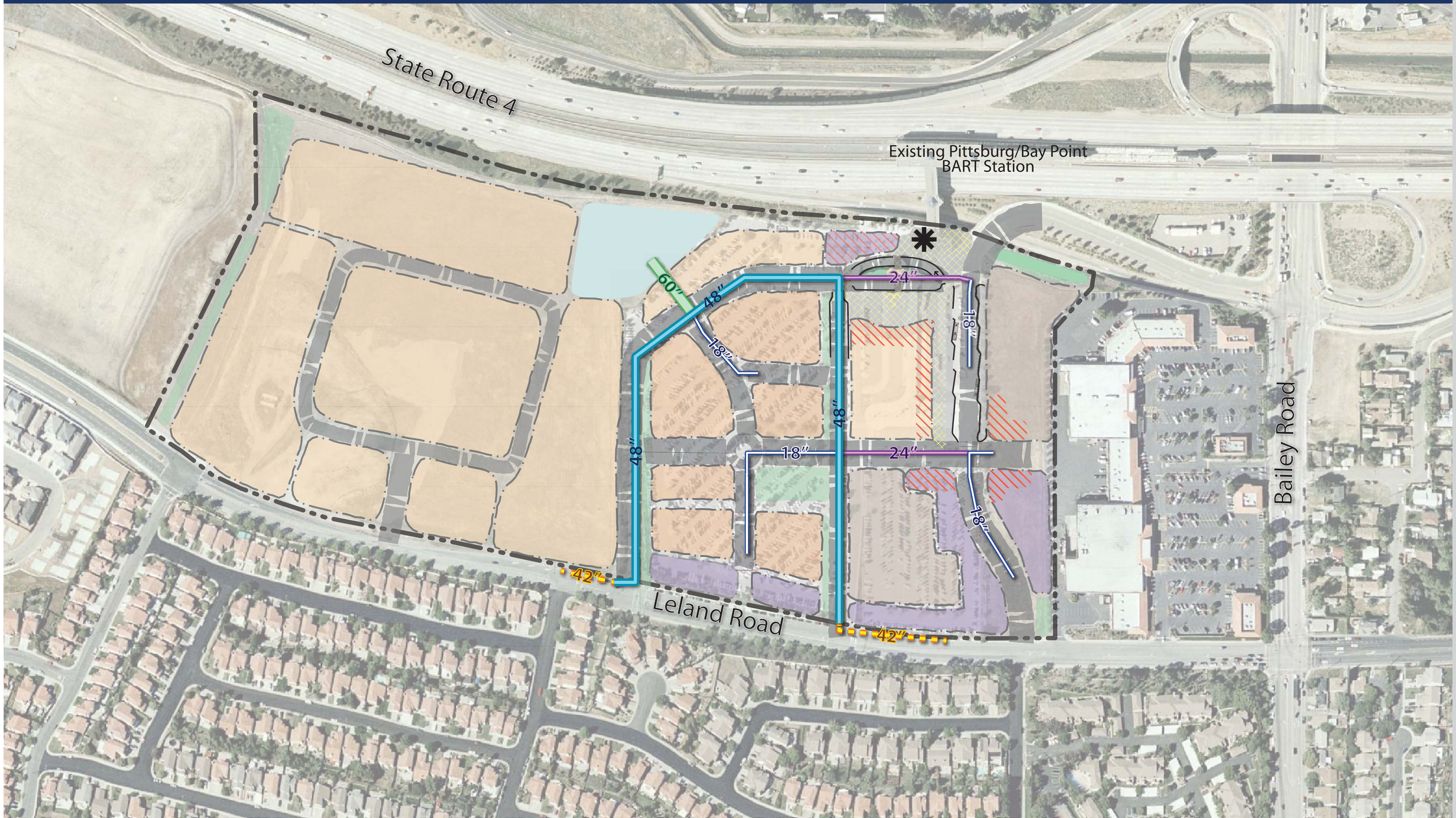
north

Pittsburg/Bay Point BART Master Plan
Pittsburg, California

Infrastructure Plan
Existing Storm Drain

Mark Thomas & Company, Inc.
Providing Engineering, Surveying and Planning Services

Figure X.X
Land Use Plan



legend

- 60" Storm Drain
- 48" Storm Drain
- 48" Existing Storm Drain
- 42" Storm Drain
- 42" Existing Storm Drain
- 24" Storm Drain
- 18" Storm Drain
- BART Entrance

Boundaries

- Core Project Area

Land Uses

- Detention Basin
- Medium Density Residential
- High Density Residential
- Ground Floor Retail
- Flex*
- Parking
- Parks & Open Space
- Urban Plaza
- Roadways

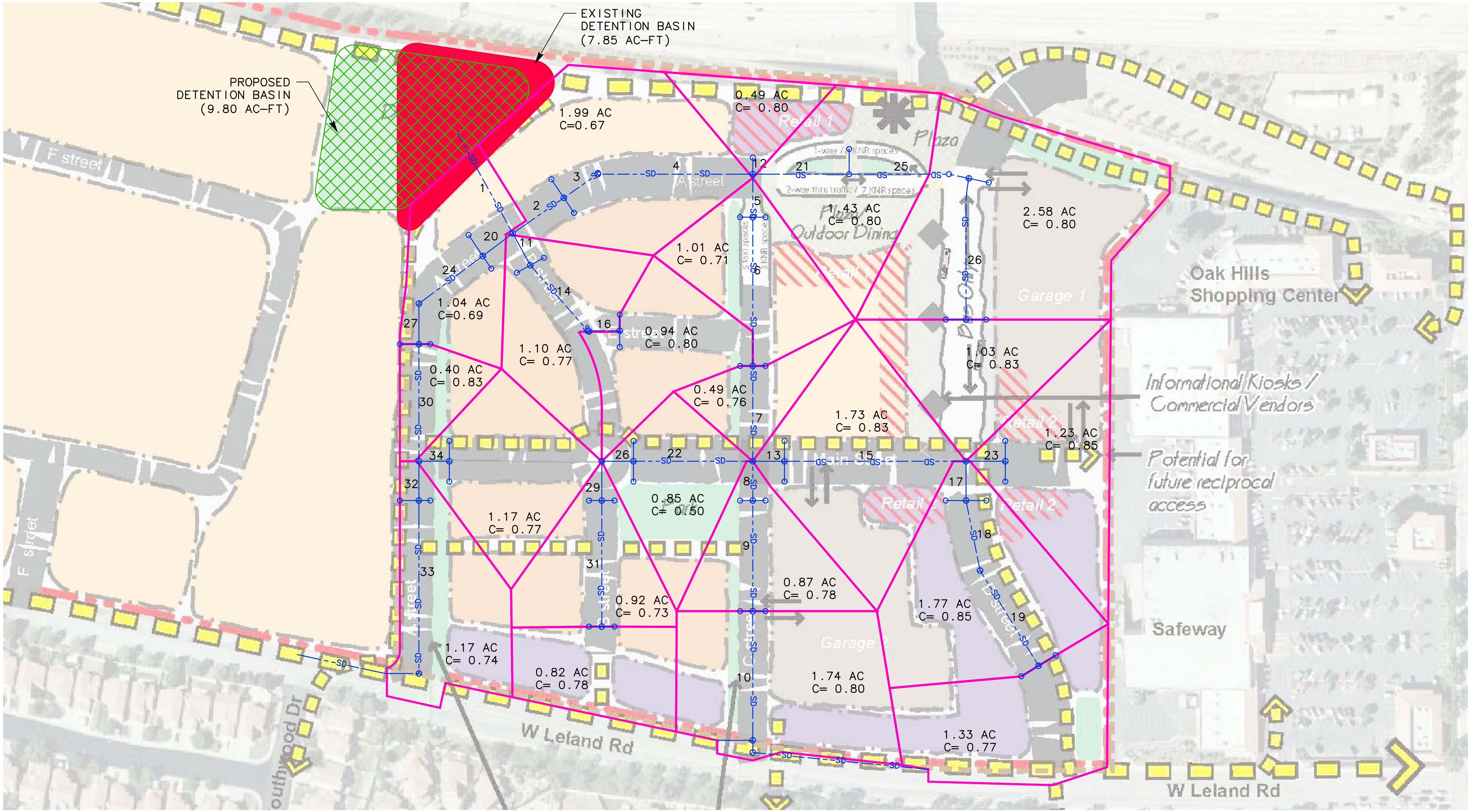
* Flex space can be residential, retail, office, public or what the market dictates when the development starts to build out

200 100 0 200
Feet (approximate)
north

Pittsburg/Bay Point BART Master Plan
Pittsburg, California

Infrastructure Plan
Storm Drain

Mark Thomas & Company, Inc.
Providing Engineering, Surveying and Planning Services



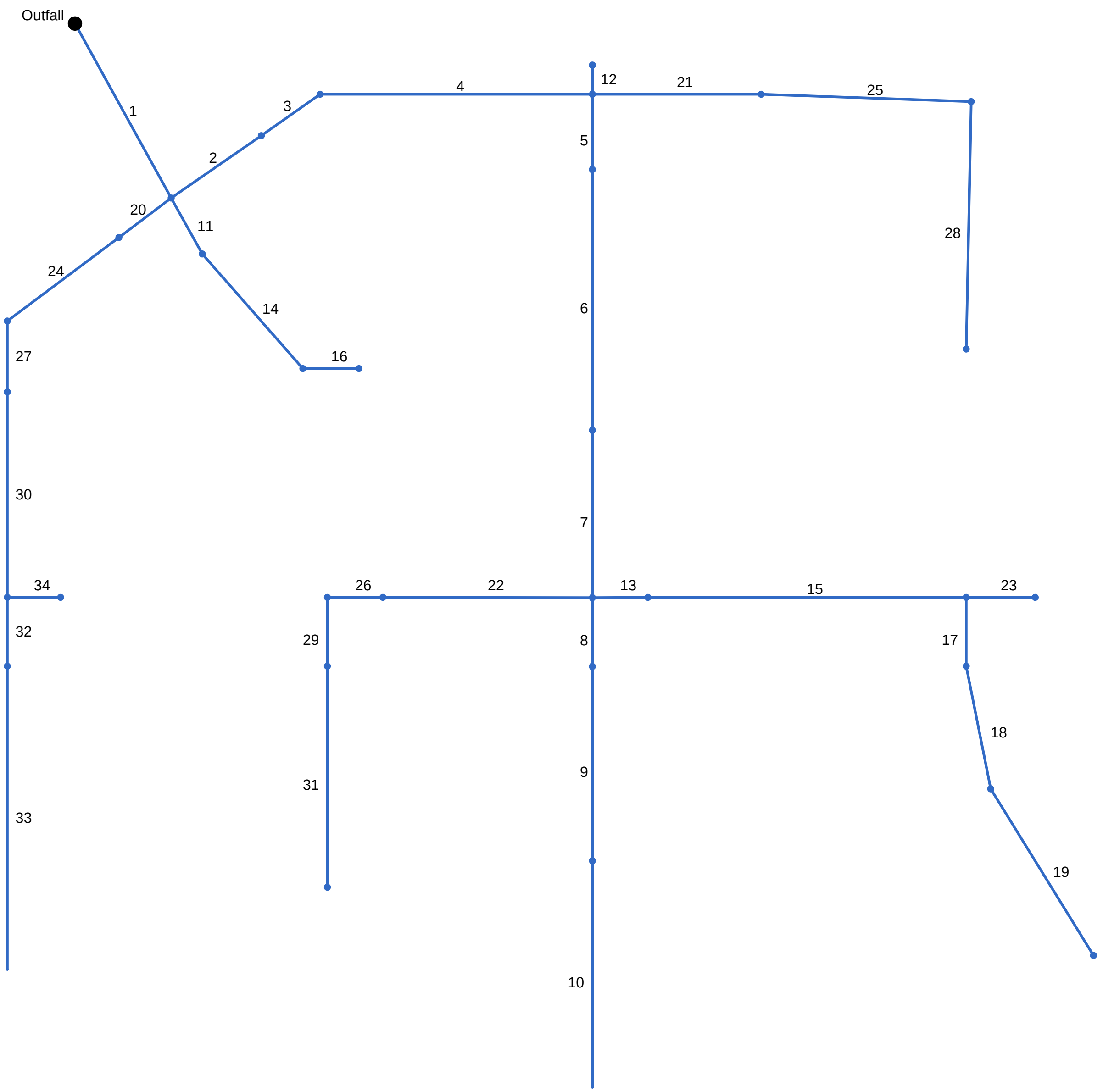
SCALE: 1" = 150'
DATE: JAN 2011
FILE: CC-09102-002

PITTSBURG / BAY POINT BART MASTER PLAN

STORM DRAIN RUNOFF AREAS

MARK THOMAS & COMPANY, INC.
Providing Engineering, Surveying and Planning Services
1243 ALPINE ROAD, SUITE 222
WALNUT CREEK, CALIFORNIA 94596
TEL: (925) 938-0383 FAX: (925) 938-0389

Hydraflow Storm Sewers Extension for AutoCAD® Civil 3D® 2009 Plan



Project File: PMC_Preliminary_100yr.stm	Number of lines: 34	Date: 01-25-2011

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line shape	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	179.561	61.116	MH	0.00	0.00	0.00	0.0	145.00	1.00	146.80	60	Cir	0.013	1.00	0.00	
2	1	98.342	-96.029	Genr	0.00	1.99	0.67	5.0	147.80	1.00	148.78	48	Cir	0.013	0.50	0.00	
3	2	65.049	0.000	MH	0.00	0.00	0.00	0.0	148.78	1.00	149.43	48	Cir	0.013	0.63	0.00	
4	3	244.738	34.913	MH	0.00	0.00	0.00	0.0	149.43	1.00	151.88	48	Cir	0.013	1.00	0.00	
5	4	67.872	90.000	Genr	0.00	1.01	0.71	5.0	151.88	1.00	152.56	48	Cir	0.013	0.50	0.00	
6	5	234.794	0.000	Genr	0.00	0.49	0.76	5.0	152.56	1.00	154.91	48	Cir	0.013	0.50	0.00	
7	6	150.524	0.000	MH	0.00	0.00	0.00	0.0	154.91	1.00	156.42	48	Cir	0.013	1.00	0.00	
8	7	62.000	0.000	Genr	0.00	0.87	0.78	5.0	156.42	1.00	157.04	48	Cir	0.013	0.50	0.00	
9	8	175.000	0.000	Genr	0.00	1.74	0.80	5.0	157.04	1.00	158.79	48	Cir	0.013	0.50	0.00	
10	9	204.000	0.000	None	100.00	0.00	0.00	0.0	158.79	1.00	160.83	48	Cir	0.013	1.00	0.00	
11	1	57.446	-0.219	Genr	0.00	1.10	0.77	5.0	153.55	0.99	154.12	18	Cir	0.013	0.50	0.00	
12	4	26.169	-90.096	Genr	0.00	0.49	0.80	5.0	154.38	0.99	154.64	18	Cir	0.013	1.00	0.00	
13	7	49.956	-90.115	Genr	0.00	1.73	0.83	5.0	158.42	1.00	158.92	24	Cir	0.013	0.50	0.00	
14	11	137.359	-12.048	MH	0.00	0.00	0.00	0.0	147.37	1.00	148.74	18	Cir	0.013	0.79	0.00	
15	13	286.594	0.115	MH	0.00	0.00	0.00	0.0	158.92	1.00	161.79	24	Cir	0.013	1.00	0.00	
16	14	50.540	-48.849	Genr	0.00	0.94	0.80	5.0	148.74	1.01	149.25	18	Cir	0.013	1.00	0.00	
17	15	62.000	90.000	Genr	0.00	1.77	0.85	5.0	162.29	1.00	162.91	18	Cir	0.013	0.50	0.00	
18	17	112.696	-11.375	MH	0.00	0.00	0.00	0.0	162.91	1.00	164.04	18	Cir	0.013	0.40	0.00	
19	18	176.000	-20.215	Genr	0.00	1.33	0.77	5.0	164.04	1.00	165.80	18	Cir	0.013	1.00	0.00	
20	1	59.087	81.973	Genr	0.00	1.04	0.69	5.0	147.80	1.00	148.39	48	Cir	0.013	0.50	0.00	
21	4	152.060	-0.015	Genr	0.00	1.43	0.80	5.0	153.88	1.00	155.40	24	Cir	0.013	0.50	0.00	
22	7	188.382	90.031	Genr	0.00	0.85	0.50	5.0	158.92	1.00	160.80	18	Cir	0.013	0.50	0.00	
23	15	62.050	-0.093	Genr	0.00	1.23	0.85	5.0	162.29	1.00	162.91	18	Cir	0.013	1.00	0.00	

Project File: PMC_Preliminary_100yr.stm	Number of lines: 34	Date: 01-25-2011

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line shape	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
24	20	125.727	0.116	MH	0.00	0.00	0.00	0.0	148.39	1.00	149.65	48	Cir	0.013	0.83	0.00	
25	21	189.155	2.013	Genr	0.00	2.58	0.80	5.0	155.90	1.00	157.79	18	Cir	0.013	1.50	0.00	
26	22	50.000	-0.031	MH	0.00	0.00	0.00	0.0	160.80	1.00	161.30	18	Cir	0.013	1.00	0.00	
27	24	63.850	-53.205	Genr	0.00	0.40	0.83	5.0	149.65	1.00	150.29	48	Cir	0.013	0.50	0.00	
28	25	223.000	89.171	Genr	0.00	1.03	0.83	5.0	157.79	1.00	160.02	18	Cir	0.013	1.00	0.00	
29	26	62.000	-90.000	Genr	0.00	0.92	0.73	5.0	161.30	1.00	161.92	18	Cir	0.013	0.50	0.00	
30	27	185.009	0.000	MH	0.00	0.00	0.00	0.0	150.29	1.00	152.14	48	Cir	0.013	1.00	0.00	
31	29	198.901	0.000	Genr	0.00	0.82	0.78	5.0	161.92	1.00	163.91	18	Cir	0.013	1.00	0.00	
32	30	62.000	0.000	Genr	0.00	1.17	0.74	5.0	152.14	1.00	152.76	48	Cir	0.013	0.50	0.00	
33	32	273.000	0.000	None	100.00	0.00	0.00	0.0	152.14	1.00	154.87	48	Cir	0.013	1.00	0.00	
34	30	48.076	-90.120	Genr	0.00	1.17	0.77	5.0	152.14	1.00	152.62	12	Cir	0.013	1.00	0.00	

Project File: PMC_Preliminary_100yr.stm	Number of lines: 34	Date: 01-25-2011

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev. (ft)	Structure Shape	Structure Length (ft)	Structure Width (ft)	Line Out Size (in)	Line Out Shape	Line Out Invert (ft)	Line In Size (in)	Line In Shape	Line In Invert (ft)
1		Manhole	0.00	Cir	4.00	4.00	60	Cir	146.80	48 18 48	Cir Cir Cir	147.80 153.55 147.80
2		Generic	0.00	Cir	4.00	4.00	48	Cir	148.78	48	Cir	148.78
3		Manhole	0.00	Cir	4.00	4.00	48	Cir	149.43	48	Cir	149.43
4		Manhole	0.00	Cir	4.00	4.00	48	Cir	151.88	48 18 24	Cir Cir Cir	151.88 154.38 153.88
5		Generic	0.00	Cir	4.00	4.00	48	Cir	152.56	48	Cir	152.56
6		Generic	0.00	Cir	4.00	4.00	48	Cir	154.91	48	Cir	154.91
7		Manhole	0.00	Cir	4.00	4.00	48	Cir	156.42	48 24 18	Cir Cir Cir	156.42 158.42 158.92
8		Generic	0.00	Cir	4.00	4.00	48	Cir	157.04	48	Cir	157.04
9		Generic	0.00	Cir	4.00	4.00	48	Cir	158.79	48	Cir	158.79
10		None	0.00	n/a	n/a	n/a	48	Cir	160.83			
11		Generic	0.00	Cir	4.00	4.00	18	Cir	154.12	18	Cir	147.37
12		Generic	0.00	Cir	4.00	4.00	18	Cir	154.64			
13		Generic	0.00	Cir	4.00	4.00	24	Cir	158.92	24	Cir	158.92
14		Manhole	0.00	Cir	4.00	4.00	18	Cir	148.74	18	Cir	148.74
15		Manhole	0.00	Cir	4.00	4.00	24	Cir	161.79	18 18	Cir Cir	162.29 162.29
16		Generic	0.00	Cir	4.00	4.00	18	Cir	149.25			
17		Generic	0.00	Cir	4.00	4.00	18	Cir	162.91	18	Cir	162.91
18		Manhole	0.00	Cir	4.00	4.00	18	Cir	164.04	18	Cir	164.04
19		Generic	0.00	Cir	4.00	4.00	18	Cir	165.80			
20		Generic	0.00	Cir	4.00	4.00	48	Cir	148.39	48	Cir	148.39

Project File: PMC_Preliminary_100yr.stm	Number of Structures: 34	Run Date: 01-25-2011

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev. (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
21		Generic	0.00	Cir	4.00	4.00	24	Cir	155.40	18	Cir	155.90
22		Generic	0.00	Cir	4.00	4.00	18	Cir	160.80	18	Cir	160.80
23		Generic	0.00	Cir	4.00	4.00	18	Cir	162.91			
24		Manhole	0.00	Cir	4.00	4.00	48	Cir	149.65	48	Cir	149.65
25		Generic	0.00	Cir	4.00	4.00	18	Cir	157.79	18	Cir	157.79
26		Manhole	0.00	Cir	4.00	4.00	18	Cir	161.30	18	Cir	161.30
27		Generic	0.00	Cir	4.00	4.00	48	Cir	150.29	48	Cir	150.29
28		Generic	0.00	Cir	4.00	4.00	18	Cir	160.02			
29		Generic	0.00	Cir	4.00	4.00	18	Cir	161.92	18	Cir	161.92
30		Manhole	0.00	Cir	4.00	4.00	48	Cir	152.14	48 12	Cir Cir	152.14 152.14
31		Generic	0.00	Cir	4.00	4.00	18	Cir	163.91			
32		Generic	0.00	Cir	4.00	4.00	48	Cir	152.76	48	Cir	152.14
33		None	0.00	n/a	n/a	n/a	48	Cir	154.87			
34		Generic	0.00	Cir	4.00	4.00	12	Cir	152.62			

Project File: PMC_Preliminary_100yr.stm	Number of Structures: 34	Run Date: 01-25-2011

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.	Junction Type
1		246.9	60	Cir	179.561	145.00	146.80	1.002	149.50	151.21	n/a	151.21	End	Manhole
2		136.9	48	Cir	98.342	147.80	148.78	0.997	151.21	152.27	1.08	152.27	1	Generic
3		133.9	48	Cir	65.049	148.78	149.43	0.999	152.27	152.89	n/a	152.89	2	Manhole
4		134.6	48	Cir	244.738	149.43	151.88	1.001	152.89	155.35	n/a	155.35	3	Manhole
5		124.0	48	Cir	67.872	151.88	152.56	1.002	155.35	155.85	n/a	155.85	4	Generic
6		122.7	48	Cir	234.794	152.56	154.91	1.001	155.85	158.19	n/a	158.19	5	Generic
7		122.1	48	Cir	150.524	154.91	156.42	1.003	158.19	159.69	n/a	159.69	6	Manhole
8		107.0	48	Cir	62.000	156.42	157.04	1.000	159.69	160.10	n/a	160.10	7	Generic
9		104.8	48	Cir	175.000	157.04	158.79	1.000	160.10	161.82	0.82	161.82	8	Generic
10		100.0	48	Cir	204.000	158.79	160.83	1.000	161.82	163.79	n/a	163.79	9	None
11		4.64	18	Cir	57.446	153.55	154.12	0.992	154.25	154.94	0.17	154.94	1	Generic
12		1.36	18	Cir	26.169	154.38	154.64	0.994	155.35	155.34	0.04	155.38	4	Generic
13		12.82	24	Cir	49.956	158.42	158.92	1.001	159.69	160.19	n/a	160.19	7	Generic
14		2.48	18	Cir	137.359	147.37	148.74	0.997	154.94*	155.02*	0.02	155.04	11	Manhole
15		9.98	24	Cir	286.594	158.92	161.79	1.001	160.19	162.91	n/a	162.91 j	13	Manhole
16		2.62	18	Cir	50.540	148.74	149.25	1.009	155.04*	155.07*	0.03	155.11	14	Generic
17		7.17	18	Cir	62.000	162.29	162.91	1.000	163.20	163.93	n/a	163.93	15	Generic
18		3.13	18	Cir	112.696	162.91	164.04	1.003	163.93	164.72	n/a	164.72 j	17	Manhole
19		3.57	18	Cir	176.000	164.04	165.80	1.000	164.72	166.52	0.28	166.52	18	Generic
20		109.0	48	Cir	59.087	147.80	148.39	0.999	151.21	151.48	n/a	151.48	1	Generic
21		11.26	24	Cir	152.060	153.88	155.40	1.000	155.35	156.59	n/a	156.59 j	4	Generic
22		4.63	18	Cir	188.382	158.92	160.80	0.998	159.69	161.62	0.17	161.62	7	Generic
23		3.64	18	Cir	62.050	162.29	162.91	0.999	162.91	163.64	0.28	163.64	15	Generic
24		106.8	48	Cir	125.727	148.39	149.65	1.002	151.48	152.71	1.39	152.71	20	Manhole

Project File: PMC_Preliminary_100yr.stm | Number of lines: 34 | Run Date: 01-25-2011

NOTES: Return period = 100 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.	Junction Type
25		8.44	18	Cir	189.155	155.90	157.79	0.999	156.92	158.90	n/a	158.90	21	Generic
26		3.58	18	Cir	50.000	160.80	161.30	1.000	161.62	162.02	n/a	162.02 j	22	Manhole
27		106.9	48	Cir	63.850	149.65	150.29	1.002	152.71	153.35	n/a	153.35	24	Generic
28		2.98	18	Cir	223.000	157.79	160.02	1.000	158.90	160.68	n/a	160.68 j	25	Generic
29		3.68	18	Cir	62.000	161.30	161.92	1.000	162.02	162.65	n/a	162.65	26	Generic
30		106.0	48	Cir	185.009	150.29	152.14	1.000	153.35	155.19	1.66	155.19	27	Manhole
31		2.23	18	Cir	198.901	161.92	163.91	1.001	162.65	164.48	n/a	164.48 j	29	Generic
32		103.0	48	Cir	62.000	152.14	152.76	1.000	155.19	155.76	0.81	155.76	30	Generic
33		100.0	48	Cir	273.000	152.14	154.87	1.000	155.76	157.83	n/a	157.83	32	None
34		3.14	12	Cir	48.076	152.14	152.62	0.998	155.19*	155.56*	0.25	155.81	30	Generic

Project File: PMC_Preliminary_100yr.stm	Number of lines: 34	Run Date: 01-25-2011

NOTES: Return period = 100 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line		Incr	Total		Incr	Total	Inlet	Syst					Size	Slope	Dn	Up	Dn	Up	Dn	Up	
		(ft)	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	End	179.561	0.00	26.10	0.00	0.00	20.11	0.0	10.9	2.3	246.9	260.8	13.37	60	1.00	145.00	146.80	149.50	151.21	0.00	0.00	
2	1	98.342	1.99	20.28	0.67	1.33	15.69	5.0	10.8	2.4	136.9	143.4	11.88	48	1.00	147.80	148.78	151.21	152.27	0.00	0.00	
3	2	65.049	0.00	18.29	0.00	0.00	14.36	0.0	10.7	2.4	133.9	143.6	11.55	48	1.00	148.78	149.43	152.27	152.89	0.00	0.00	
4	3	244.738	0.00	18.29	0.00	0.00	14.36	0.0	10.3	2.4	134.6	143.7	11.64	48	1.00	149.43	151.88	152.89	155.35	0.00	0.00	
5	4	67.872	1.01	12.76	0.71	0.72	9.91	5.0	10.2	2.4	124.0	143.8	10.96	48	1.00	151.88	152.56	155.35	155.85	0.00	0.00	
6	5	234.794	0.49	11.75	0.76	0.37	9.19	5.0	9.8	2.5	122.7	143.7	11.11	48	1.00	152.56	154.91	155.85	158.19	0.00	0.00	
7	6	150.524	0.00	11.26	0.00	0.00	8.82	0.0	9.5	2.5	122.1	143.9	11.10	48	1.00	154.91	156.42	158.19	159.69	0.00	0.00	
8	7	62.000	0.87	2.61	0.78	0.68	2.07	5.0	5.3	3.4	107.0	143.6	10.05	48	1.00	156.42	157.04	159.69	160.10	0.00	0.00	
9	8	175.000	1.74	1.74	0.80	1.39	1.39	5.0	5.0	3.5	104.8	143.6	10.22	48	1.00	157.04	158.79	160.10	161.82	0.00	0.00	
10	9	204.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	100.0	143.6	9.92	48	1.00	158.79	160.83	161.82	163.79	0.00	0.00	
11	1	57.446	1.10	2.04	0.77	0.85	1.60	5.0	7.2	2.9	4.64	10.46	5.21	18	0.99	153.55	154.12	154.25	154.94	0.00	0.00	
12	4	26.169	0.49	0.49	0.80	0.39	0.39	5.0	5.0	3.5	1.36	10.47	1.41	18	0.99	154.38	154.64	155.35	155.34	0.00	0.00	
13	7	49.956	1.73	6.06	0.83	1.44	5.01	5.0	9.1	2.6	12.82	22.63	6.10	24	1.00	158.42	158.92	159.69	160.19	0.00	0.00	
14	11	137.359	0.00	0.94	0.00	0.00	0.75	0.0	5.6	3.3	2.48	10.49	1.40	18	1.00	147.37	148.74	154.94	155.02	0.00	0.00	
15	13	286.594	0.00	4.33	0.00	0.00	3.57	0.0	7.7	2.8	9.98	22.63	5.14	24	1.00	158.92	161.79	160.19	162.91	0.00	0.00	
16	14	50.540	0.94	0.94	0.80	0.75	0.75	5.0	5.0	3.5	2.62	10.55	1.48	18	1.01	148.74	149.25	155.04	155.07	0.00	0.00	
17	15	62.000	1.77	3.10	0.85	1.50	2.53	5.0	7.5	2.8	7.17	10.50	5.99	18	1.00	162.29	162.91	163.20	163.93	0.00	0.00	
18	17	112.696	0.00	1.33	0.00	0.00	1.02	0.0	6.5	3.1	3.13	10.52	3.25	18	1.00	162.91	164.04	163.93	164.72	0.00	0.00	
19	18	176.000	1.33	1.33	0.77	1.02	1.02	5.0	5.0	3.5	3.57	10.50	4.43	18	1.00	164.04	165.80	164.72	166.52	0.00	0.00	
20	1	59.087	1.04	3.78	0.69	0.72	2.82	5.0	5.9	3.2	109.0	143.5	10.01	48	1.00	147.80	148.39	151.21	151.48	0.00	0.00	
21	4	152.060	1.43	5.04	0.80	1.14	4.06	5.0	7.8	2.8	11.26	22.61	5.17	24	1.00	153.88	155.40	155.35	156.59	0.00	0.00	
22	7	188.382	0.85	2.59	0.50	0.43	1.74	5.0	8.4	2.7	4.63	10.49	4.88	18	1.00	158.92	160.80	159.69	161.62	0.00	0.00	
23	15	62.050	1.23	1.23	0.85	1.05	1.05	5.0	5.0	3.5	3.64	10.50	4.79	18	1.00	162.29	162.91	162.91	163.64	0.00	0.00	

Project File: PMC_Preliminary_100yr.stm	Number of lines: 34	Run Date: 01-25-2011

NOTES: Intensity = 8.29 / (Inlet time + 0.20) ^ 0.53; Return period = 100 Yrs. ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
24	20	125.727	0.00	2.74	0.00	0.00	2.10	0.0	5.7	3.3	106.8	143.8	10.32	48	1.00	148.39	149.65	151.48	152.71	0.00	0.00	
25	21	189.155	2.58	3.61	0.80	2.06	2.92	5.0	7.2	2.9	8.44	10.50	6.31	18	1.00	155.90	157.79	156.92	158.90	0.00	0.00	
26	22	50.000	0.00	1.74	0.00	0.00	1.31	0.0	8.1	2.7	3.58	10.50	3.93	18	1.00	160.80	161.30	161.62	162.02	0.00	0.00	
27	24	63.850	0.40	2.74	0.83	0.33	2.10	5.0	5.6	3.3	106.9	143.8	10.37	48	1.00	149.65	150.29	152.71	153.35	0.00	0.00	
28	25	223.000	1.03	1.03	0.83	0.85	0.85	5.0	5.0	3.5	2.98	10.50	3.06	18	1.00	157.79	160.02	158.90	160.68	0.00	0.00	
29	26	62.000	0.92	1.74	0.73	0.67	1.31	5.0	7.6	2.8	3.68	10.50	4.34	18	1.00	161.30	161.92	162.02	162.65	0.00	0.00	
30	27	185.009	0.00	2.34	0.00	0.00	1.77	0.0	5.2	3.4	106.0	143.6	10.31	48	1.00	150.29	152.14	153.35	155.19	0.00	0.00	
31	29	198.901	0.82	0.82	0.78	0.64	0.64	5.0	5.0	3.5	2.23	10.50	3.11	18	1.00	161.92	163.91	162.65	164.48	0.00	0.00	
32	30	62.000	1.17	1.17	0.74	0.87	0.87	5.0	5.0	3.5	103.0	143.6	10.11	48	1.00	152.14	152.76	155.19	155.76	0.00	0.00	
33	32	273.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	100.0	143.6	9.20	48	1.00	152.14	154.87	155.76	157.83	0.00	0.00	
34	30	48.076	1.17	1.17	0.77	0.90	0.90	5.0	5.0	3.5	3.14	3.56	3.99	12	1.00	152.14	152.62	155.19	155.56	0.00	0.00	

Project File: PMC_Preliminary_100yr.stm | Number of lines: 34 | Run Date: 01-25-2011

NOTES: Intensity = 8.29 / (Inlet time + 0.20) ^ 0.53; Return period = 100 Yrs. ; c = cir e = ellip b = box

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp line No
							Ht (in)	L (ft)	area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1		0.00	0.01	0.00	0.01	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
2		4.64	0.01	4.64	0.01	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	1
3		0.00	0.01	0.00	0.01	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	2
4		0.00	0.01	0.00	0.01	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	3
5		2.50	0.00	2.50	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	4
6		1.30	0.00	1.30	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	5
7		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	6
8		2.36	0.00	2.36	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	7
9		4.85	100.00	104.85	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	8
10		100.00*	0.00	0.00	100.00	None	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	9
11		2.95	0.00	2.95	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	1
12		1.36	0.00	1.36	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	4
13		5.00	0.00	5.00	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	7
14		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	11
15		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	13
16		2.62	0.00	2.62	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	14
17		5.24	0.00	5.24	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	15
18		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	17
19		3.57	0.00	3.57	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	18
20		2.50	0.00	2.50	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	1
21		3.98	0.00	3.98	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	4
22		1.48	0.00	1.48	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	7
23		3.64	0.00	3.64	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	15

Project File: PMC_Preliminary_100yr.stm	Number of lines: 34	Run Date: 01-25-2011

NOTES: Inlet N-Values = 0.016 ; Intensity = 8.29 / (Inlet time + 0.20) ^ 0.53; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet Ht (in)	Curb Inlet L (ft)	Grate Inlet area (sqft)	Grate Inlet L (ft)	Grate Inlet W (ft)	Gutter So (ft/ft)	Gutter W (ft)	Gutter Sw (ft/ft)	Gutter Sx (ft/ft)	Gutter n	Gutter Depth (ft)	Gutter Spread (ft)	Inlet Depth (ft)	Inlet Spread (ft)	Inlet Depr (in)	Byp line No
24		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	20
25		7.19	0.00	7.19	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	21
26		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	22
27		1.16	0.00	1.16	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	24
28		2.98	0.00	2.98	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	25
29		2.34	0.00	2.34	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	26
30		0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	27
31		2.23	0.00	2.23	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	29
32		3.01	100.00	103.01	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	30
33		100.00*	0.00	0.00	100.00	None	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	32
34		3.14	0.00	3.14	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	30

Project File: PMC_Preliminary_100yr.stm	Number of lines: 34	Run Date: 01-25-2011

NOTES: Inlet N-Values = 0.016 ; Intensity = 8.29 / (Inlet time + 0.20) ^ 0.53; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.

FL-DOT Report

Date: 01-25-2011

Frequency: 100 yrs

Proj: PMC_Preliminary_100

Line No	To Line	Type of struc	n - value	Len (ft)	Drainage Area (C1 = 0.2, C2 = 0.5, C3 = 0.9) Incre-ment (ac)	Sub-total (ac)	Sum CA	Time of conc (min)	Time of flow in sect (min)	Inten (I) (in/hr)	Total CA	Add Q / Total flow / Q (cfs)	Inlet elev (ft)	Elev of HGL / Elev of Crown / Elev of Invert: Up (ft)	Down (ft)	Fall (ft)	Rise / Span / Size (in)	HGL / Pipe / Slope (%)	Actual / Full Flow: Vel (ft/s)	Cap (cfs)	Line description
1	End	MH	0.013	179.561	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.92	0.24	2.33	20.11	0.00 246.9	0.00	151.21 151.80 146.80	149.50 150.00 145.00	1.71 1.80	60 60 Cir	0.95 1.00	13.37 13.28	246.9 260.8	
2	1	Genr	0.013	98.342	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.77	0.15	2.35	15.69	0.00 136.9	0.00	152.27 152.78 148.78	151.21 151.80 147.80	1.06 0.98	48 48 Cir	1.08 1.00	11.88 11.41	136.9 143.4	
3	2	MH	0.013	65.049	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.67	0.10	2.36	14.36	0.00 133.9	0.00	152.89 153.43 149.43	152.27 152.78 148.78	0.62 0.65	48 48 Cir	0.96 1.00	11.55 11.43	133.9 143.6	
4	3	MH	0.013	244.738	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.28	0.39	2.41	14.36	0.00 134.6	0.00	155.35 155.88 151.88	152.89 153.43 149.43	2.46 2.45	48 48 Cir	1.00 1.00	11.64 11.44	134.6 143.7	
5	4	Genr	0.013	67.872	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.16	0.12	2.42	9.91	0.00 124.0	0.00	155.85 156.56 152.56	155.35 155.88 151.88	0.51 0.68	48 48 Cir	0.74 1.00	10.96 11.44	124.0 143.8	
6	5	Genr	0.013	234.794	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	9.76	0.40	2.47	9.19	0.00 122.7	0.00	158.19 158.91 154.91	155.85 156.56 152.56	2.33 2.35	48 48 Cir	0.99 1.00	11.11 11.44	122.7 143.7	
7	6	MH	0.013	150.524	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	9.51	0.26	2.51	8.82	0.00 122.1	0.00	159.69 160.42 156.42	158.19 158.91 154.91	1.50 1.51	48 48 Cir	1.00 1.00	11.10 11.45	122.1 143.9	
8	7	Genr	0.013	62.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.35	0.12	3.36	2.07	0.00 107.0	0.00	160.10 161.04 157.04	159.69 160.42 156.42	0.41 0.62	48 48 Cir	0.66 1.00	10.05 11.43	107.0 143.6	
9	8	Genr	0.013	175.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.35	3.48	1.39	0.00 104.8	0.00	161.82 162.79 158.79	160.10 161.04 157.04	1.72 1.75	48 48 Cir	0.98 1.00	10.22 11.43	104.8 143.6	
10	9	None	0.013	204.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00	0.43	0.00	0.00	100.0 100.0	0.00	163.79 164.83 160.83	161.82 162.79 158.79	1.97 2.04	48 48 Cir	0.97 1.00	9.92 11.43	100.0 143.6	
11	1	Genr	0.013	57.446	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.16	0.33	2.90	1.60	0.00 4.64	0.00	154.94 155.62 154.12	154.25 155.05 153.55	0.69 0.57	18 18 Cir	1.21 0.99	5.21 5.92	4.64 10.46	

NOTES: Intensity = 8.29 / (Inlet time + 0.20) ^ 0.53 (in/hr) ; Time of flow in section is based on full flow.

Project File: PMC_Preliminary_100yr.stm

FL-DOT Report

Date: 01-25-2011
Frequency: 100 yrs
Proj: PMC_Preliminary_100

Drainage Area: C1 = 0.2, C2 = 0.5, C3 = 0.9

Line No	To Line	Type of struc	n - value	Len (ft)	Drainage Area Incre-ment (ac)	Drainage Area Sub-total (ac)	Drainage Area Sum CA	Time of conc (min)	Time of flow in sect (min)	Inten (I) (in/hr)	Total CA	Add Q Total flow Q (cfs)	Inlet elev (ft)	Elev of HGL Elev of Crown Elev of Invert Up (ft)	Elev of HGL Elev of Crown Elev of Invert Down (ft)	Fall (ft)	Rise Span Size (in)	HGL Pipe Slope (%)	Actual Full Flow Vel (ft/s)	Actual Full Flow Cap (cfs)	Line description
12	4	Genr	0.013	26.169	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.56	3.48	0.39	0.00 1.36	0.00	155.34 156.14 154.64	155.35 155.88 154.38	-0.01 0.26	18 18 Cir	-0.03 0.99	1.41 5.92	1.36 10.47	
13	7	Genr	0.013	49.956	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	9.14	0.20	2.56	5.01	0.00 12.82	0.00	160.19 160.92 158.92	159.69 160.42 158.42	0.50 0.50	24 24 Cir	1.00 1.00	6.10 7.20	12.82 22.63	
14	11	MH	0.013	137.359	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.57	1.59	3.30	0.75	0.00 2.48	0.00	155.02 150.24 148.74	154.94 148.87 147.37	0.08 1.37	18 18 Cir	0.06 1.00	1.40 5.93	2.48 10.49	
15	13	MH	0.013	286.594	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.71	1.43	2.79	3.57	0.00 9.98	0.00	162.91 163.79 161.79	160.19 160.92 158.92	2.72 2.87	24 24 Cir	0.95 1.00	5.14 7.20	9.98 22.63	
16	14	Genr	0.013	50.540	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.57	3.48	0.75	0.00 2.62	0.00	155.07 150.75 149.25	155.04 150.24 148.74	0.03 0.51	18 18 Cir	0.06 1.01	1.48 5.97	2.62 10.55	
17	15	Genr	0.013	62.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.47	0.24	2.84	2.53	0.00 7.17	0.00	163.93 164.41 162.91	163.20 163.79 162.29	0.73 0.62	18 18 Cir	1.18 1.00	5.99 5.94	7.17 10.50	
18	17	MH	0.013	112.696	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	6.45	1.02	3.06	1.02	0.00 3.13	0.00	164.72 165.54 164.04	163.93 164.41 162.91	0.78 1.13	18 18 Cir	0.69 1.00	3.25 5.95	3.13 10.52	
19	18	Genr	0.013	176.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	1.45	3.48	1.02	0.00 3.57	0.00	166.52 167.30 165.80	164.72 165.54 164.04	1.81 1.76	18 18 Cir	1.03 1.00	4.43 5.94	3.57 10.50	
20	1	Genr	0.013	59.087	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.94	0.11	3.19	2.82	0.00 109.0	0.00	151.48 152.39 148.39	151.21 151.80 147.80	0.27 0.59	48 48 Cir	0.45 1.00	10.01 11.42	109.0 143.5	
21	4	Genr	0.013	152.060	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.82	0.68	2.77	4.06	0.00 11.26	0.00	156.59 157.40 155.40	155.35 155.88 153.88	1.24 1.52	24 24 Cir	0.82 1.00	5.17 7.20	11.26 22.61	
22	7	Genr	0.013	188.382	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	8.44	1.07	2.67	1.74	0.00 4.63	0.00	161.62 162.30 160.80	159.69 160.42 158.92	1.93 1.88	18 18 Cir	1.03 1.00	4.88 5.94	4.63 10.49	

NOTES: Intensity = 8.29 / (Inlet time + 0.20) ^ 0.53 (in/hr) ; Time of flow in section is based on full flow.

Project File: PMC_Preliminary_100yr.stm

FL-DOT Report

Date: 01-25-2011
Frequency: 100 yrs
Proj: PMC_Preliminary_100

Line No	To Line	Type of struc	n - value	Len (ft)	Drainage Area C1 = 0.2 C2 = 0.5 C3 = 0.9 Incre- ment (ac)	Sub- total (ac)	Sum CA	Time of conc (min)	Time of flow in sect (min)	Inten (I) (in/hr)	Total CA	Add Q / Total flow / Q (cfs)	Inlet elev (ft)	Elev of HGL / Elev of Crown / Elev of Invert Up (ft)	Down (ft)	Fall (ft)	Rise / Span / Size (in)	HGL / Pipe / Slope (%)	Actual Full Flow Vel (ft/s)	Cap (cfs)	Line description
23	15	Genr	0.013	62.050	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.50	3.48	1.05	0.00 3.64	0.00	163.64 164.41 162.91	162.91 163.79 162.29	0.73 0.62	18 18 Cir	1.18 1.00	4.79 5.94	3.64 10.50	
24	20	MH	0.013	125.727	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.69	0.25	3.26	2.10	0.00 106.8	0.00	152.71 153.65 149.65	151.48 152.39 148.39	1.23 1.26	48 48 Cir	0.98 1.00	10.32 11.44	106.8 143.8	
25	21	Genr	0.013	189.155	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.21	0.61	2.89	2.92	0.00 8.44	0.00	158.90 159.29 157.79	156.92 157.40 155.90	1.98 1.89	18 18 Cir	1.05 1.00	6.31 5.94	8.44 10.50	
26	22	MH	0.013	50.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	8.07	0.37	2.73	1.31	0.00 3.58	0.00	162.02 162.80 161.30	161.62 162.30 160.80	0.40 0.50	18 18 Cir	0.80 1.00	3.93 5.94	3.58 10.50	
27	24	Genr	0.013	63.850	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.57	0.13	3.30	2.10	0.00 106.9	0.00	153.35 154.29 150.29	152.71 153.65 149.65	0.64 0.64	48 48 Cir	1.00 1.00	10.37 11.44	106.9 143.8	
28	25	Genr	0.013	223.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	2.21	3.48	0.85	0.00 2.98	0.00	160.68 161.52 160.02	158.90 159.29 157.79	1.78 2.23	18 18 Cir	0.80 1.00	3.06 5.94	2.98 10.50	
29	26	Genr	0.013	62.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.63	0.44	2.81	1.31	0.00 3.68	0.00	162.65 163.42 161.92	162.02 162.80 161.30	0.63 0.62	18 18 Cir	1.02 1.00	4.34 5.94	3.68 10.50	
30	27	MH	0.013	185.009	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.20	0.37	3.41	1.77	0.00 106.0	0.00	155.19 156.14 152.14	153.35 154.29 150.29	1.84 1.85	48 48 Cir	0.99 1.00	10.31 11.43	106.0 143.6	
31	29	Genr	0.013	198.901	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	2.63	3.48	0.64	0.00 2.23	0.00	164.48 165.41 163.91	162.65 163.42 161.92	1.83 1.99	18 18 Cir	0.92 1.00	3.11 5.94	2.23 10.50	
32	30	Genr	0.013	62.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.13	3.48	0.87	0.00 103.0	0.00	155.76 156.76 152.76	155.19 156.14 152.14	0.58 0.62	48 48 Cir	0.93 1.00	10.11 11.43	103.0 143.6	
33	32	None	0.013	273.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00	0.57	0.00	0.00	100.0 100.0	0.00	157.83 158.87 154.87	155.76 156.14 152.14	2.07 2.73	48 48 Cir	0.76 1.00	9.20 11.43	100.0 143.6	

NOTES: Intensity = 8.29 / (Inlet time + 0.20) ^ 0.53 (in/hr) ; Time of flow in section is based on full flow.

Project File: PMC_Preliminary_100yr.stm

FL-DOT Report

Line No	To Line	Type of struc	n - value	Len (ft)	Drainage Area C1 = 0.2 C2 = 0.5 C3 = 0.9 Incre-ment (ac)	Sub-total (ac)	Sum CA	Time of conc (min)	Time of flow in sect (min)	Inten (I) (in/hr)	Total CA	Add Q / Total flow / Q (cfs)	Inlet elev (ft)	Elev of HGL / Elev of Crown / Elev of Invert Up (ft)	Down (ft)	Fall (ft)	Rise / Span / Size (in)	HGL / Pipe / Slope (%)	Actual Full Flow Vel (ft/s)	Cap (cfs)	Date: 01-25-2011 Frequency: 100 yrs Proj: PMC_Preliminary_100 Line description
34	30	Genr	0.013	48.076	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.20	3.48	0.90	0.00 3.14	0.00	155.56 153.62 152.62	155.19 153.14 152.14	0.37 0.48	12 12 Cir	0.78 1.00	3.99 4.53	3.14 3.56	

NOTES: Intensity = 8.29 / (Inlet time + 0.20) ^ 0.53 (in/hr) ; Time of flow in section is based on full flow.

Project File: PMC_Preliminary_100yr.stm

MyReport

Line No.	Area Dn (sqft)	Area Up (sqft)	Byp Ln No	Coeff C1 (C)	Coeff C2 (C)	Coeff C3 (C)	Capac Full (cfs)	Crit Depth (ft)	Cross Sl, Sw (ft/ft)	Cross Sl, Sx (ft/ft)	Curb Len (ft)	Defl Ang (Deg)	Depth Dn (ft)	Depth Up (ft)	DnStm Ln No	Drng Area (ac)	Easting X (ft)	EGL Dn (ft)	EGL Up (ft)	Energy Loss (ft)
1	18.33	18.33	n/a	0.20	0.50	0.90	260.79	4.41	....	....	....	61.116	4.50	4.41**	Outfall	0.00	6144745.24	152.24	154.03	1.435
2	11.41	11.63	1	0.20	0.50	0.90	143.40	3.49	0.050	0.020	....	-96.029	3.41	3.49**	1	1.99	6144825.88	153.45	154.42	0.825
3	11.56	11.56	2	0.20	0.50	0.90	143.59	3.46	....	....	....	0.000	3.49	3.46**	2	0.00	6144879.22	154.33	154.98	0.517
4	11.56	11.57	3	0.20	0.50	0.90	143.72	3.47	....	....	....	34.913	3.46	3.47**	3	0.00	6145123.96	155.00	157.45	1.971
5	11.57	11.07	4	0.20	0.50	0.90	143.78	3.29	0.050	0.020	....	90.000	3.47	3.29**	4	1.01	6145123.96	157.13	157.80	0.482
6	11.07	11.02	5	0.20	0.50	0.90	143.71	3.28	0.050	0.020	....	0.000	3.29	3.28**	5	0.49	6145123.96	157.76	160.12	1.708
7	11.02	10.99	6	0.20	0.50	0.90	143.87	3.27	....	....	....	0.000	3.28	3.27**	6	0.00	6145123.96	160.10	161.61	1.091
8	10.99	10.31	7	0.20	0.50	0.90	143.65	3.06	0.050	0.020	....	0.000	3.27	3.06**	7	0.87	6145123.96	161.16	161.77	0.371
9	10.31	10.21	8	0.20	0.50	0.90	143.65	3.03	0.050	0.020	....	0.000	3.06	3.03**	8	1.74	6145123.96	161.71	163.46	1.085
10	10.21	9.96	9	0.20	0.50	0.90	143.65	2.96	....	....	....	0.000	3.03	2.96**	9	0.00	6145123.96	163.31	165.35	1.196
11	0.81	0.99	1	0.20	0.50	0.90	10.46	0.82	0.050	0.020	....	-0.219	0.70	0.82**	1	1.10	6144773.18	154.76	155.28	0.450
12	1.21	0.81	4	0.20	0.50	0.90	10.47	0.45	0.050	0.020	....	-90.096	0.97	0.70	4	0.49	6145123.91	155.37	155.38	0.015
13	2.10	2.10	7	0.20	0.50	0.90	22.63	1.27	0.050	0.020	....	-90.115	1.27	1.27**	7	1.73	6145173.91	160.27	160.77	0.301
14	1.77	1.77	11	0.20	0.50	0.90	10.49	0.60	....	....	....	-12.048	1.50	1.50	11	0.00	6144863.57	154.97	155.05	0.077
15	2.10	1.81	13	0.20	0.50	0.90	22.63	1.12	....	....	....	0.115	1.27	1.12**	13	0.00	6145460.51	160.54	163.38	1.294
16	1.77	1.77	14	0.20	0.50	0.90	10.55	0.62	0.050	0.020	....	-48.849	1.50	1.50	14	0.94	6144914.11	155.08	155.11	0.031
17	1.12	1.28	15	0.20	0.50	0.90	10.50	1.02	0.050	0.020	....	90.000	0.91	1.02**	15	1.77	6145460.51	163.84	164.42	0.531
18	1.28	0.77	17	0.20	0.50	0.90	10.52	0.68	....	....	....	-11.375	1.02	0.68**	17	0.00	6145482.73	164.03	164.97	0.365
19	0.77	0.84	18	0.20	0.50	0.90	10.50	0.72	0.050	0.020	....	-20.215	0.68	0.72**	18	1.33	6145574.93	165.05	166.80	1.048
20	11.41	10.41	1	0.20	0.50	0.90	143.54	3.09	0.050	0.020	....	81.973	3.41	3.09**	1	1.04	6144697.99	152.63	153.18	0.351
21	2.47	1.95	4	0.20	0.50	0.90	22.61	1.19	0.050	0.020	....	-0.015	1.47	1.19**	4	1.43	6145276.02	155.67	157.11	0.669
22	0.91	0.99	7	0.20	0.50	0.90	10.49	0.82	0.050	0.020	....	90.031	0.77	0.82**	7	0.85	6144935.57	160.09	161.96	1.216
23	0.69	0.85	15	0.20	0.50	0.90	10.50	0.73	0.050	0.020	....	-0.093	0.62	0.73**	15	1.23	6145522.56	163.34	163.92	0.458

Project File: PMC_Preliminary_100yr.stm | Number of lines: 34 | Date: 01-25-2011

NOTES: ** Critical depth

MyReport

Line No.	Area Dn (sqft)	Area Up (sqft)	Byp Ln No	Coeff C1 (C)	Coeff C2 (C)	Coeff C3 (C)	Capac Full (cfs)	Crit Depth (ft)	Cross Sl, Sw (ft/ft)	Cross Sl, Sx (ft/ft)	Curb Len (ft)	Defl Ang (Deg)	Depth Dn (ft)	Depth Up (ft)	DnStm Ln No	Drng Area (ac)	Easting X (ft)	EGL Dn (ft)	EGL Up (ft)	Energy Loss (ft)
24	10.41	10.31	20	0.20	0.50	0.90	143.80	3.06	....	....	....	0.116	3.09	3.06**	20	0.00	6144597.31	153.12	154.38	0.793
25	1.28	1.40	21	0.20	0.50	0.90	10.50	1.11	0.050	0.020	....	2.013	1.02	1.11**	21	2.58	6145465.06	157.60	159.46	1.705
26	0.99	0.84	22	0.20	0.50	0.90	10.50	0.72	....	....	....	-0.031	0.82	0.72**	22	0.00	6144885.57	161.82	162.30	0.218
27	10.31	10.31	24	0.20	0.50	0.90	143.82	3.06	0.050	0.020	....	-53.205	3.06	3.06**	24	0.40	6144597.31	154.38	155.02	0.407
28	1.40	0.75	25	0.20	0.50	0.90	10.50	0.66	0.050	0.020	....	89.171	1.11	0.66**	25	1.03	6145460.51	158.97	160.93	0.675
29	0.84	0.86	26	0.20	0.50	0.90	10.50	0.73	0.050	0.020	....	-90.000	0.72	0.73**	26	0.92	6144885.57	162.32	162.94	0.339
30	10.31	10.27	27	0.20	0.50	0.90	143.64	3.05	....	....	....	0.000	3.06	3.05**	27	0.00	6144597.31	154.99	156.84	1.166
31	0.86	0.62	29	0.20	0.50	0.90	10.50	0.57	0.050	0.020	....	0.000	0.73	0.57**	29	0.82	6144885.57	162.76	164.68	0.671
32	10.27	10.12	30	0.20	0.50	0.90	143.65	3.00	0.050	0.020	....	0.000	3.05	3.00**	30	1.17	6144597.31	156.75	157.37	0.377
33	11.96	9.96	32	0.20	0.50	0.90	143.65	2.96	....	....	....	0.000	3.62	2.96**	32	0.00	6144597.31	156.85	159.39	1.402
34	0.79	0.79	30	0.20	0.50	0.90	3.56	0.75	0.050	0.020	....	-90.120	1.00	1.00	30	1.17	6144645.39	155.43	155.81	0.373

Project File: PMC_Preliminary_100yr.stm	Number of lines: 34	Date: 01-25-2011

NOTES: ** Critical depth

MyReport

Flow Rate (cfs)	Sf Ave (ft/ft)	Sf Dn (ft/ft)	Grate Area (sqft)	Grate Len (ft)	Grate Width (ft)	Gnd/Rim El Dn (ft)	Gnd/Rim El Up (ft)	Gutter Depth (ft)	Gutter Slope (ft/ft)	Gutter Spread (ft)	Gutter Width (ft)	HGL Dn (ft)	HGL Up (ft)	HGL Jnct (ft)	HGL Jmp Dn (ft)	HGL Jmp Up (ft)	Incr CxA	Incr Q (cfs)	Inlet Depth (ft)	Inlet Eff (%)
246.93	0.799	0.791	....	....	....	0.00	0.00	....	....	....	....	149.50	151.21	151.21	....	....	0.00	0.00	....	....
136.90	0.839	0.852	....	....	....	0.00	0.00	0.30	Sag	12.00	2.00	151.21	152.27	152.27	....	....	1.33	4.64	0.30	100
133.93	0.794	0.791	....	....	....	0.00	0.00	....	....	....	....	152.27	152.89	152.89	....	....	0.00	0.00	....	....
134.58	0.805	0.806	....	....	....	0.00	0.00	....	....	....	....	152.89	155.35	155.35	....	....	0.00	0.00	....	....
124.00	0.711	0.683	....	....	....	0.00	0.00	0.30	Sag	12.00	2.00	155.35	155.85	155.85	....	....	0.72	2.50	0.30	100
122.73	0.727	0.724	....	....	....	0.00	0.00	0.30	Sag	12.00	2.00	155.85	158.19	158.19	....	....	0.37	1.30	0.30	100
122.11	0.725	0.723	....	....	....	0.00	0.00	....	....	....	....	158.19	159.69	159.69	....	....	0.00	0.00	....	....
106.97	0.598	0.558	....	....	....	0.00	0.00	0.30	Sag	12.00	2.00	159.69	160.10	160.10	....	....	0.68	2.36	0.30	100
104.85	0.620	0.613	....	....	....	0.00	0.00	0.30	Sag	12.00	2.00	160.10	161.82	161.82	....	....	1.39	4.85	0.30	100
100.00	0.586	0.570	....	....	....	0.00	0.00	....	....	....	....	161.82	163.79	163.79	....	....	0.00	100.00	....	....
4.64	0.784	0.992	....	....	....	0.00	0.00	0.30	Sag	12.00	2.00	154.25	154.94	154.94	....	....	0.85	2.95	0.30	100
1.36	0.058	0.030	....	....	....	0.00	0.00	0.30	Sag	12.00	2.00	155.35	155.34	155.38	....	....	0.39	1.36	0.30	100
12.82	0.603	0.603	....	....	....	0.00	0.00	0.30	Sag	12.00	2.00	159.69	160.19	160.19	....	....	1.44	5.00	0.30	100
2.48	0.056	0.056	....	....	....	0.00	0.00	....	....	....	....	154.94	155.02	155.04	....	....	0.00	0.00	....	....
9.98	0.451	0.365	....	....	....	0.00	0.00	....	....	....	....	160.19	162.91 j	162.91	160.33	160.21	0.00	0.00	....	....
2.62	0.062	0.062	....	....	....	0.00	0.00	0.30	Sag	12.00	2.00	155.04	155.07	155.11	....	....	0.75	2.62	0.30	100
7.17	0.857	0.999	....	....	....	0.00	0.00	0.30	Sag	12.00	2.00	163.20	163.93	163.93	....	....	1.50	5.24	0.30	100
3.13	0.324	0.136	....	....	....	0.00	0.00	....	....	....	....	163.93	164.72 j	164.72	163.92	163.63	0.00	0.00	....	....
3.57	0.596	0.663	....	....	....	0.00	0.00	0.30	Sag	12.00	2.00	164.72	166.52	166.52	....	....	1.02	3.57	0.30	100
108.99	0.594	0.540	....	....	....	0.00	0.00	0.30	Sag	12.00	2.00	151.21	151.48	151.48	....	....	0.72	2.50	0.30	100
11.26	0.440	0.314	....	....	....	0.00	0.00	0.30	Sag	12.00	2.00	155.35	156.59 j	156.59	155.23	155.15	1.14	3.98	0.30	100
4.63	0.646	0.716	....	....	....	0.00	0.00	0.30	Sag	12.00	2.00	159.69	161.62	161.62	....	....	0.43	1.48	0.30	100
3.64	0.739	0.946	....	....	....	0.00	0.00	0.30	Sag	12.00	2.00	162.91	163.64	163.64	....	....	1.05	3.64	0.30	100

Project File: PMC_Preliminary_100yr.stm | Number of lines: 34 | Date: 01-25-2011

NOTES: ** Critical depth

MyReport

Flow Rate (cfs)	Sf Ave (ft/ft)	Sf Dn (ft/ft)	Grate Area (sqft)	Grate Len (ft)	Grate Width (ft)	Gnd/Rim El Dn (ft)	Gnd/Rim El Up (ft)	Gutter Depth (ft)	Gutter Slope (ft/ft)	Gutter Spread (ft)	Gutter Width (ft)	HGL Dn (ft)	HGL Up (ft)	HGL Jnct (ft)	HGL Jmp Dn (ft)	HGL Jmp Up (ft)	Incr CxA	Incr Q (cfs)	Inlet Depth (ft)	Inlet Eff (%)
106.84	0.630	0.623	....	....	....	0.00	0.00	....	....	....	....	151.48	152.71	152.71	....	....	0.00	0.00	....	....
8.44	0.901	0.999	....	....	....	0.00	0.00	0.30	Sag	12.00	2.00	156.92	158.90	158.90	....	....	2.06	7.19	0.30	100
3.58	0.436	0.343	....	....	....	0.00	0.00	....	....	....	....	161.62	162.02 j	162.02	161.58	161.53	0.00	0.00	....	....
106.92	0.638	0.638	....	....	....	0.00	0.00	0.30	Sag	12.00	2.00	152.71	153.35	153.35	....	....	0.33	1.16	0.30	100
2.98	0.303	0.100	....	....	....	0.00	0.00	0.30	Sag	12.00	2.00	158.90	160.68 j	160.68	158.88	158.60	0.85	2.98	0.30	100
3.68	0.547	0.560	....	....	....	0.00	0.00	0.30	Sag	12.00	2.00	162.02	162.65	162.65	....	....	0.67	2.34	0.30	100
106.03	0.630	0.627	....	....	....	0.00	0.00	....	....	....	....	153.35	155.19	155.19	....	....	0.00	0.00	....	....
2.23	0.337	0.195	....	....	....	0.00	0.00	0.30	Sag	12.00	2.00	162.65	164.48 j	164.48	162.69	162.61	0.64	2.23	0.30	100
103.01	0.607	0.597	....	....	....	0.00	0.00	0.30	Sag	12.00	2.00	155.19	155.76	155.76	....	....	0.87	3.01	0.30	100
100.00	0.514	0.425	....	....	....	0.00	0.00	....	....	....	....	155.76	157.83	157.83	....	....	0.00	100.00	....	....
3.14	0.776	0.776	....	....	....	0.00	0.00	0.30	Sag	12.00	2.00	155.19	155.56	155.81	....	....	0.90	3.14	0.30	100

Project File: PMC_Preliminary_100yr.stm	Number of lines: 34	Date: 01-25-2011

NOTES: ** Critical depth

MyReport

Inlet ID	Inlet Loc	Inlet Spread (ft)	Inlet Time (min)	i Sys (in/hr)	i Inlet (in/hr)	Invert Dn (ft)	Invert Up (ft)	Jump Loc (ft)	Jump Len (ft)	Vel Hd Jmp Dn (ft)	Vel Hd Jmp Up (ft)	J-Loss Coeff	Junct Type	Known Q (cfs)	Cost RCP ($)	Cost CMP ($)	Cost PVC ($)	Line ID
	Sag	....	0.0	2.33	0.00	145.00	146.80	....	....	0.00	0.00	1.00	MH	0.00	9,973	8,975	8,477	
	Sag	12.00	5.0	2.35	3.48	147.80	148.78	....	....	0.00	0.00	0.50	Generic	0.00	4,804	4,324	4,083	
	Sag	....	0.0	2.36	0.00	148.78	149.43	....	....	0.00	0.00	0.63	MH	0.00	3,220	2,898	2,737	
	Sag	....	0.0	2.41	0.00	149.43	151.88	....	....	0.00	0.00	1.00	MH	0.00	11,836	10,652	10,061	
	Sag	12.00	5.0	2.42	3.48	151.88	152.56	....	....	0.00	0.00	0.50	Generic	0.00	3,340	3,006	2,839	
	Sag	12.00	5.0	2.47	3.48	152.56	154.91	....	....	0.00	0.00	0.50	Generic	0.00	11,356	10,220	9,653	
	Sag	....	0.0	2.51	0.00	154.91	156.42	....	....	0.00	0.00	1.00	MH	0.00	7,324	6,592	6,225	
	Sag	12.00	5.0	3.36	3.48	156.42	157.04	....	....	0.00	0.00	0.50	Generic	0.00	3,076	2,768	2,615	
	Sag	12.00	5.0	3.48	3.48	157.04	158.79	....	....	0.00	0.00	0.50	Generic	0.00	8,500	7,650	7,225	
	On Grade	....	0.0	0.00	0.00	158.79	160.83	....	....	0.00	0.00	1.00	None	100.00	9,892	8,903	8,408	
	Sag	12.00	5.0	2.90	3.48	153.55	154.12	....	....	0.00	0.00	0.50	Generic	0.00	1,924	1,732	1,635	
	Sag	12.00	5.0	3.48	3.48	154.38	154.64	....	....	0.00	0.00	1.00	Generic	0.00	932	839	792	
	Sag	12.00	5.0	2.56	3.48	158.42	158.92	....	....	0.00	0.00	0.50	Generic	0.00	1,882	1,694	1,600	
	Sag	....	0.0	3.30	0.00	147.37	148.74	....	....	0.00	0.00	0.79	MH	0.00	4,484	4,036	3,811	
	Sag	....	0.0	2.79	0.00	158.92	161.79	28.66	5.59	0.47	0.72	1.00	MH	0.00	10,414	9,373	8,852	
	Sag	12.00	5.0	3.48	3.48	148.74	149.25	....	....	0.00	0.00	1.00	Generic	0.00	1,716	1,544	1,459	
	Sag	12.00	5.0	2.84	3.48	162.29	162.91	....	....	0.00	0.00	0.50	Generic	0.00	2,084	1,876	1,771	
	Sag	....	0.0	3.06	0.00	162.91	164.04	11.27	4.48	0.13	0.41	0.40	MH	0.00	3,700	3,330	3,145	
	Sag	12.00	5.0	3.48	3.48	164.04	165.80	....	....	0.00	0.00	1.00	Generic	0.00	5,732	5,159	4,872	
	Sag	12.00	5.0	3.19	3.48	147.80	148.39	....	....	0.00	0.00	0.50	Generic	0.00	2,932	2,639	2,492	
	Sag	12.00	5.0	2.77	3.48	153.88	155.40	15.21	5.97	0.52	0.70	0.50	Generic	0.00	5,572	5,015	4,736	
	Sag	12.00	5.0	2.67	3.48	158.92	160.80	....	....	0.00	0.00	0.50	Generic	0.00	6,116	5,504	5,199	
	Sag	12.00	5.0	3.48	3.48	162.29	162.91	....	....	0.00	0.00	1.00	Generic	0.00	2,084	1,876	1,771	

Project File: PMC_Preliminary_100yr.stm	Number of lines: 34	Date: 01-25-2011

NOTES: Intensity = 8.29 / (Inlet time + 0.20) ^ 0.53 -- Return period = 100 Yrs. ;   ** Critical depth

MyReport

Inlet ID	Inlet Loc	Inlet Spread (ft)	Inlet Time (min)	i Sys (in/hr)	i Inlet (in/hr)	Invert Dn (ft)	Invert Up (ft)	Jump Loc (ft)	Jump Len (ft)	Vel Hd Jmp Dn (ft)	Vel Hd Jmp Up (ft)	J-Loss Coeff	Junct Type	Known Q (cfs)	Cost RCP ($)	Cost CMP ($)	Cost PVC ($)	Line ID
	Sag	....	0.0	3.26	0.00	148.39	149.65	....	....	0.00	0.00	0.83	MH	0.00	6,124	5,512	5,205	
	Sag	12.00	5.0	2.89	3.48	155.90	157.79	....	....	0.00	0.00	1.50	Generic	0.00	6,148	5,533	5,226	
	Sag	....	0.0	2.73	0.00	160.80	161.30	5.00	3.63	0.28	0.37	1.00	MH	0.00	1,700	1,530	1,445	
	Sag	12.00	5.0	3.30	3.48	149.65	150.29	....	....	0.00	0.00	0.50	Generic	0.00	3,148	2,833	2,676	
	Sag	12.00	5.0	3.48	3.48	157.79	160.02	22.30	4.34	0.12	0.41	1.00	Generic	0.00	7,236	6,512	6,151	
	Sag	12.00	5.0	2.81	3.48	161.30	161.92	....	....	0.00	0.00	0.50	Generic	0.00	2,084	1,876	1,771	
	Sag	....	0.0	3.41	0.00	150.29	152.14	....	....	0.00	0.00	1.00	MH	0.00	8,980	8,082	7,633	
	Sag	12.00	5.0	3.48	3.48	161.92	163.91	19.89	2.85	0.20	0.36	1.00	Generic	0.00	6,452	5,807	5,484	
	Sag	12.00	5.0	3.48	3.48	152.14	152.76	....	....	0.00	0.00	0.50	Generic	0.00	3,076	2,768	2,615	
	On Grade	....	0.0	0.00	0.00	152.14	154.87	....	....	0.00	0.00	1.00	None	100.00	13,204	11,884	11,223	
	Sag	12.00	5.0	3.48	3.48	152.14	152.62	....	....	0.00	0.00	1.00	Generic	0.00	1,444	1,300	1,227	

Project File: PMC_Preliminary_100yr.stm | Number of lines: 34 | Date: 01-25-2011

NOTES: Intensity = 8.29 / (Inlet time + 0.20) ^ 0.53 -- Return period = 100 Yrs. ; ** Critical depth

MyReport

Line Length (ft)	Line Size (in)	Line Slope (%)	Line Type	Local Depr (in)	n-val Gutter	n-val Pipe	Minor Loss (ft)	Northing Y (ft)	Pipe Travel (min)	Q Byp (cfs)	Q Capt (cfs)	Q Carry (cfs)	Line Rise (in)	Runoff Coeff (C)	Line Span (in)	Area A1 (ac)	Area A2 (ac)	Area A3 (ac)	Tc (min)	Throat Ht (in)	Total Area (ac)
179.561	60	1.00	Cir	....	....	0.013	n/a	2196255.78	0.24	....	....	....	60	0.00	60	0.00	0.00	0.00	10.9	....	26.10
98.342	48	1.00	Cir	0.0	....	0.013	1.08	2196312.06	0.15	0.01	4.64	0.01	48	0.67	48	0.00	0.00	0.00	10.8	....	20.28
65.049	48	1.00	Cir	....	....	0.013	n/a	2196349.29	0.10	....	....	....	48	0.00	48	0.00	0.00	0.00	10.7	....	18.29
244.738	48	1.00	Cir	....	....	0.013	n/a	2196349.29	0.39	....	....	....	48	0.00	48	0.00	0.00	0.00	10.3	....	18.29
67.872	48	1.00	Cir	0.0	....	0.013	n/a	2196281.42	0.12	0.00	2.50	0.00	48	0.71	48	0.00	0.00	0.00	10.2	....	12.76
234.794	48	1.00	Cir	0.0	....	0.013	n/a	2196046.62	0.40	0.00	1.30	0.00	48	0.76	48	0.00	0.00	0.00	9.8	....	11.75
150.524	48	1.00	Cir	....	....	0.013	n/a	2195896.10	0.26	....	....	....	48	0.00	48	0.00	0.00	0.00	9.5	....	11.26
62.000	48	1.00	Cir	0.0	....	0.013	n/a	2195834.10	0.12	0.00	2.36	0.00	48	0.78	48	0.00	0.00	0.00	5.3	....	2.61
175.000	48	1.00	Cir	0.0	....	0.013	0.82	2195659.10	0.35	0.00	104.85	100.00	48	0.80	48	0.00	0.00	0.00	5.0	....	1.74
204.000	48	1.00	Cir	....	....	0.013	n/a	2195455.10	0.43	....	....	....	48	0.00	48	0.00	0.00	0.00	0.0	....	0.00
57.446	18	0.99	Cir	0.0	....	0.013	0.17	2196205.58	0.33	0.00	2.95	0.00	18	0.77	18	0.00	0.00	0.00	7.2	....	2.04
26.169	18	0.99	Cir	0.0	....	0.013	0.04	2196375.46	0.56	0.00	1.36	0.00	18	0.80	18	0.00	0.00	0.00	5.0	....	0.49
49.956	24	1.00	Cir	0.0	....	0.013	n/a	2195896.20	0.20	0.00	5.00	0.00	24	0.83	24	0.00	0.00	0.00	9.1	....	6.06
137.359	18	1.00	Cir	....	....	0.013	0.02	2196102.16	1.59	....	....	....	18	0.00	18	0.00	0.00	0.00	5.6	....	0.94
286.594	24	1.00	Cir	....	....	0.013	n/a	2195896.20	1.43	....	....	....	24	0.00	24	0.00	0.00	0.00	7.7	....	4.33
50.540	18	1.01	Cir	0.0	....	0.013	0.03	2196102.16	0.57	0.00	2.62	0.00	18	0.80	18	0.00	0.00	0.00	5.0	....	0.94
62.000	18	1.00	Cir	0.0	....	0.013	n/a	2195834.20	0.24	0.00	5.24	0.00	18	0.85	18	0.00	0.00	0.00	7.5	....	3.10
112.696	18	1.00	Cir	....	....	0.013	n/a	2195723.72	1.02	....	....	....	18	0.00	18	0.00	0.00	0.00	6.5	....	1.33
176.000	18	1.00	Cir	0.0	....	0.013	0.28	2195573.80	1.45	0.00	3.57	0.00	18	0.77	18	0.00	0.00	0.00	5.0	....	1.33
59.087	48	1.00	Cir	0.0	....	0.013	n/a	2196220.29	0.11	0.00	2.50	0.00	48	0.69	48	0.00	0.00	0.00	5.9	....	3.78
152.060	24	1.00	Cir	0.0	....	0.013	n/a	2196349.33	0.68	0.00	3.98	0.00	24	0.80	24	0.00	0.00	0.00	7.8	....	5.04
188.382	18	1.00	Cir	0.0	....	0.013	0.17	2195896.20	1.07	0.00	1.48	0.00	18	0.50	18	0.00	0.00	0.00	8.4	....	2.59
62.050	18	1.00	Cir	0.0	....	0.013	0.28	2195896.30	0.50	0.00	3.64	0.00	18	0.85	18	0.00	0.00	0.00	5.0	....	1.23

Project File: PMC_Preliminary_100yr.stm | Number of lines: 34 | Date: 01-25-2011

NOTES: ** Critical depth

MyReport

Line Length (ft)	Line Size (in)	Line Slope (%)	Line Type	Local Depr (in)	n-val Gutter	n-val Pipe	Minor Loss (ft)	Northing Y (ft)	Pipe Travel (min)	Q Byp (cfs)	Q Capt (cfs)	Q Carry (cfs)	Line Rise (in)	Runoff Coeff (C)	Line Span (in)	Area A1 (ac)	Area A2 (ac)	Area A3 (ac)	Tc (min)	Throat Ht (in)	Total Area (ac)
125.727	48	1.00	Cir	....	....	0.013	1.39	2196144.99	0.25	....	....	....	48	0.00	48	0.00	0.00	0.00	5.7	....	2.74
189.155	18	1.00	Cir	0.0	....	0.013	n/a	2196342.74	0.61	0.00	7.19	0.00	18	0.80	18	0.00	0.00	0.00	7.2	....	3.61
50.000	18	1.00	Cir	....	....	0.013	n/a	2195896.20	0.37	....	....	....	18	0.00	18	0.00	0.00	0.00	8.1	....	1.74
63.850	48	1.00	Cir	0.0	....	0.013	n/a	2196081.14	0.13	0.00	1.16	0.00	48	0.83	48	0.00	0.00	0.00	5.6	....	2.74
223.000	18	1.00	Cir	0.0	....	0.013	n/a	2196119.78	2.21	0.00	2.98	0.00	18	0.83	18	0.00	0.00	0.00	5.0	....	1.03
62.000	18	1.00	Cir	0.0	....	0.013	n/a	2195834.20	0.44	0.00	2.34	0.00	18	0.73	18	0.00	0.00	0.00	7.6	....	1.74
185.009	48	1.00	Cir	....	....	0.013	1.66	2195896.13	0.37	....	....	....	48	0.00	48	0.00	0.00	0.00	5.2	....	2.34
198.901	18	1.00	Cir	0.0	....	0.013	n/a	2195635.30	2.63	0.00	2.23	0.00	18	0.78	18	0.00	0.00	0.00	5.0	....	0.82
62.000	48	1.00	Cir	0.0	....	0.013	0.81	2195834.13	0.13	0.00	103.01	100.00	48	0.74	48	0.00	0.00	0.00	5.0	....	1.17
273.000	48	1.00	Cir	....	....	0.013	n/a	2195561.13	0.57	....	....	....	48	0.00	48	0.00	0.00	0.00	0.0	....	0.00
48.076	12	1.00	Cir	0.0	....	0.013	0.25	2195896.23	0.20	0.00	3.14	0.00	12	0.77	12	0.00	0.00	0.00	5.0	....	1.17

Project File: PMC_Preliminary_100yr.stm | Number of lines: 34 | Date: 01-25-2011

NOTES: ** Critical depth

MyReport

Total CxA	Total Runoff (cfs)	Vel Ave (ft/s)	Vel Dn (ft/s)	Vel Hd Dn (ft)	Vel Hd Up (ft)	Vel Up (ft/s)	Cover Dn (ft)	Cover Up (ft)	Storage (cft)
20.11	46.93	13.37	13.27	2.74	2.82	13.47	N/A	N/A	3317.06
15.69	36.90	11.88	12.00	2.24	2.15	11.77	N/A	N/A	1132.96
14.36	33.93	11.55	11.52	2.06	2.09	11.59	N/A	N/A	754.02
14.36	34.58	11.64	11.65	2.11	2.10	11.63	N/A	N/A	2830.21
9.91	24.00	10.96	10.71	1.78	1.95	11.20	N/A	N/A	768.73
9.19	22.73	11.11	11.09	1.91	1.93	11.14	N/A	N/A	2592.89
8.82	22.11	11.10	11.08	1.91	1.92	11.11	N/A	N/A	1656.45
2.07	6.97	10.05	9.73	1.47	1.67	10.37	N/A	N/A	660.73
1.39	4.85	10.22	10.17	1.61	1.64	10.27	N/A	N/A	1795.45
0.00	0.00	9.92	9.80	1.49	1.57	10.04	N/A	N/A	2057.38
1.60	4.64	5.21	5.74	0.51	0.34	4.68	N/A	N/A	51.69
0.39	1.36	1.41	1.13	0.02	0.04	1.69	N/A	N/A	26.38
5.01	12.82	6.10	6.10	0.58	0.58	6.10	N/A	N/A	104.94
0.75	2.48	1.40	1.40	0.03	0.03	1.40	N/A	N/A	242.69
3.57	9.98	5.14	4.75	0.35	0.47	5.52	N/A	N/A	560.27
0.75	2.62	1.48	1.48	0.03	0.03	1.48	N/A	N/A	89.29
2.53	7.17	5.99	6.39	0.64	0.49	5.59	N/A	N/A	74.59
1.02	3.13	3.25	2.44	0.09	0.26	4.06	N/A	N/A	116.09
1.02	3.57	4.43	4.62	0.33	0.28	4.25	N/A	N/A	141.82
2.82	8.99	10.01	9.55	1.42	1.70	10.47	N/A	N/A	645.44
4.06	11.26	5.17	4.56	0.32	0.52	5.79	N/A	N/A	336.52
1.74	4.63	4.88	5.08	0.40	0.34	4.67	N/A	N/A	179.07
1.05	3.64	4.79	5.29	0.44	0.28	4.28	N/A	N/A	47.73

Project File: PMC_Preliminary_100yr.stm	Number of lines: 34	Date: 01-25-2011

NOTES: ** Critical depth

MyReport

Total CxA	Total Runoff (cfs)	Vel Ave (ft/s)	Vel Dn (ft/s)	Vel Hd Dn (ft)	Vel Hd Up (ft)	Vel Up (ft/s)	Cover Dn (ft)	Cover Up (ft)	Storage (cft)
2.10	6.84	10.32	10.26	1.64	1.67	10.37	N/A	N/A	1302.18
2.92	8.44	6.31	6.60	0.68	0.56	6.03	N/A	N/A	253.38
1.31	3.58	3.93	3.61	0.20	0.28	4.25	N/A	N/A	45.78
2.10	6.92	10.37	10.37	1.67	1.67	10.37	N/A	N/A	658.13
0.85	2.98	3.06	2.13	0.07	0.25	3.99	N/A	N/A	240.78
1.31	3.68	4.34	4.38	0.30	0.29	4.29	N/A	N/A	52.64
1.77	6.03	10.31	10.28	1.64	1.66	10.33	N/A	N/A	1903.30
0.64	2.23	3.11	2.60	0.10	0.20	3.62	N/A	N/A	146.33
0.87	3.01	10.11	10.03	1.57	1.61	10.18	N/A	N/A	631.85
0.00	0.00	9.20	8.36	1.09	1.57	10.04	N/A	N/A	3010.16
0.90	3.14	3.99	3.99	0.25	0.25	3.99	N/A	N/A	37.75

Project File: PMC_Preliminary_100yr.stm | Number of lines: 34 | Date: 01-25-2011

NOTES: ** Critical depth

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
1	60	246.9	145.00	149.50	4.50	18.33	13.27	2.74	152.24	0.791	179.561	146.80	151.21	4.41**	18.33	13.47	2.82	154.03	0.807	0.799	n/a	1.00	n/a
2	48	136.9	147.80	151.21	3.41	11.41	12.00	2.24	153.45	0.852	98.342	148.78	152.27	3.49**	11.63	11.77	2.15	154.42	0.826	0.839	n/a	0.50	1.08
3	48	133.9	148.78	152.27	3.49	11.56	11.52	2.06	154.33	0.791	65.049	149.43	152.89	3.46**	11.56	11.59	2.09	154.98	0.798	0.794	n/a	0.63	n/a
4	48	134.6	149.43	152.89	3.46	11.56	11.65	2.11	155.00	0.806	244.738	151.88	155.35	3.47**	11.57	11.63	2.10	157.45	0.804	0.805	n/a	1.00	n/a
5	48	124.0	151.88	155.35	3.47	11.57	10.71	1.78	157.13	0.683	67.872	152.56	155.85	3.29**	11.07	11.20	1.95	157.80	0.739	0.711	n/a	0.50	n/a
6	48	122.7	152.56	155.85	3.29	11.07	11.09	1.91	157.76	0.724	234.794	154.91	158.19	3.28**	11.02	11.14	1.93	160.12	0.731	0.727	n/a	0.50	n/a
7	48	122.1	154.91	158.19	3.28	11.02	11.08	1.91	160.10	0.723	150.524	156.42	159.69	3.27**	10.99	11.11	1.92	161.61	0.727	0.725	n/a	1.00	n/a
8	48	107.0	156.42	159.69	3.27	10.99	9.73	1.47	161.16	0.558	62.000	157.04	160.10	3.06**	10.31	10.37	1.67	161.77	0.638	0.598	n/a	0.50	n/a
9	48	104.8	157.04	160.10	3.06	10.31	10.17	1.61	161.71	0.613	175.000	158.79	161.82	3.03**	10.21	10.27	1.64	163.46	0.627	0.620	n/a	0.50	0.82
10	48	100.0	158.79	161.82	3.03	10.21	9.80	1.49	163.31	0.570	204.000	160.83	163.79	2.96**	9.96	10.04	1.57	165.35	0.603	0.586	n/a	1.00	n/a
11	18	4.64	153.55	154.25	0.70*	0.81	5.74	0.51	154.76	0.992	57.446	154.12	154.94	0.82**	0.99	4.68	0.34	155.28	0.575	0.784	n/a	0.50	0.17
12	18	1.36	154.38	155.35	0.97	1.21	1.13	0.02	155.37	0.030	26.169	154.64	155.34	0.70	0.81	1.69	0.04	155.38	0.086	0.058	0.015	1.00	0.04
13	24	12.82	158.42	159.69	1.27	2.10	6.10	0.58	160.27	0.603	49.956	158.92	160.19	1.27**	2.10	6.10	0.58	160.77	0.603	0.603	n/a	0.50	n/a
14	18	2.48	147.37	154.94	1.50	1.77	1.40	0.03	154.97	0.056	137.359	148.74	155.02	1.50	1.77	1.40	0.03	155.05	0.056	0.056	0.077	0.79	0.02
15	24	9.98	158.92	160.19	1.27	2.10	4.75	0.35	160.54	0.365	286.594	161.79	162.91 j	1.12**	1.81	5.52	0.47	163.38	0.537	0.451	n/a	1.00	0.47
16	18	2.62	148.74	155.04	1.50	1.77	1.48	0.03	155.08	0.062	50.540	149.25	155.07	1.50	1.77	1.48	0.03	155.11	0.062	0.062	0.031	1.00	0.03
17	18	7.17	162.29	163.20	0.91*	1.12	6.39	0.64	163.84	0.999	62.000	162.91	163.93	1.02**	1.28	5.59	0.49	164.42	0.715	0.857	n/a	0.50	n/a
18	18	3.13	162.91	163.93	1.02	1.28	2.44	0.09	164.03	0.136	112.696	164.04	164.72 j	0.68**	0.77	4.06	0.26	164.97	0.511	0.324	n/a	0.40	n/a
19	18	3.57	164.04	164.72	0.68	0.77	4.62	0.33	165.05	0.663	176.000	165.80	166.52	0.72**	0.84	4.25	0.28	166.80	0.529	0.596	n/a	1.00	0.28
20	48	109.0	147.80	151.21	3.41	11.41	9.55	1.42	152.63	0.540	59.087	148.39	151.48	3.09**	10.41	10.47	1.70	153.18	0.649	0.594	n/a	0.50	n/a
21	24	11.26	153.88	155.35	1.47	2.47	4.56	0.32	155.67	0.314	152.060	155.40	156.59 j	1.19**	1.95	5.79	0.52	157.11	0.566	0.440	n/a	0.50	0.26
22	18	4.63	158.92	159.69	0.77	0.91	5.08	0.40	160.09	0.716	188.382	160.80	161.62	0.82**	0.99	4.67	0.34	161.96	0.575	0.646	n/a	0.50	0.17
23	18	3.64	162.29	162.91	0.62	0.69	5.29	0.44	163.34	0.946	62.050	162.91	163.64	0.73**	0.85	4.28	0.28	163.92	0.532	0.739	n/a	1.00	0.28

Project File: PMC_Preliminary_100yr.stm	Number of lines: 34	Run Date: 01-25-2011

Notes: * Normal depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
	(in)	(cfs)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	(ft)	Invert elev (ft)	HGL elev (ft)	Depth (ft)	Area (sqft)	Vel (ft/s)	Vel head (ft)	EGL elev (ft)	Sf (%)	Ave Sf (%)	Enrgy loss (ft)	(K)	(ft)
24	48	106.8	148.39	151.48	3.09	10.41	10.26	1.64	153.12	0.623	125.727	149.65	152.71	3.06**	10.31	10.37	1.67	154.38	0.637	0.630	n/a	0.83	1.39
25	18	8.44	155.90	156.92	1.02*	1.28	6.60	0.68	157.60	0.999	189.155	157.79	158.90	1.11**	1.40	6.03	0.56	159.46	0.804	0.901	n/a	1.50	n/a
26	18	3.58	160.80	161.62	0.82	0.99	3.61	0.20	161.82	0.343	50.000	161.30	162.02 j	0.72**	0.84	4.25	0.28	162.30	0.529	0.436	n/a	1.00	0.28
27	48	106.9	149.65	152.71	3.06	10.31	10.37	1.67	154.38	0.638	63.850	150.29	153.35	3.06**	10.31	10.37	1.67	155.02	0.638	0.638	n/a	0.50	n/a
28	18	2.98	157.79	158.90	1.11	1.40	2.13	0.07	158.97	0.100	223.000	160.02	160.68 j	0.66**	0.75	3.99	0.25	160.93	0.506	0.303	n/a	1.00	0.25
29	18	3.68	161.30	162.02	0.72	0.84	4.38	0.30	162.32	0.560	62.000	161.92	162.65	0.73**	0.86	4.29	0.29	162.94	0.533	0.547	n/a	0.50	n/a
30	48	106.0	150.29	153.35	3.06	10.31	10.28	1.64	154.99	0.627	185.009	152.14	155.19	3.05**	10.27	10.33	1.66	156.84	0.633	0.630	n/a	1.00	1.66
31	18	2.23	161.92	162.65	0.73	0.86	2.60	0.10	162.76	0.195	198.901	163.91	164.48 j	0.57**	0.62	3.62	0.20	164.68	0.480	0.337	n/a	1.00	0.20
32	48	103.0	152.14	155.19	3.05	10.27	10.03	1.57	156.75	0.597	62.000	152.76	155.76	3.00**	10.12	10.18	1.61	157.37	0.618	0.607	n/a	0.50	0.81
33	48	100.0	152.14	155.76	3.62	11.96	8.36	1.09	156.85	0.425	273.000	154.87	157.83	2.96**	9.96	10.04	1.57	159.39	0.603	0.514	n/a	1.00	n/a
34	12	3.14	152.14	155.19	1.00	0.79	3.99	0.25	155.43	0.776	48.076	152.62	155.56	1.00	0.79	3.99	0.25	155.81	0.776	0.776	0.373	1.00	0.25

Project File: PMC_Preliminary_100yr.stm	Number of lines: 34	Run Date: 01-25-2011

Notes: * Normal depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

Bay Area Hydrology Model
PROJECT REPORT

Project Name: **PITTSBURG/ BAY POINT - DET BASIN STUDY w/OUT WCHB DEVELOPMENT**
Site Address: **PMC - Development**
City : **Pittsburg**
Report Date : 1/27/2011
Gage : LIVERMORE (Equivalent to Pittsburg Mean Seasonal Precipitation)
Data Start : 1959/10/01
Data End : 2004/09/30
Precip Scale: 1.67
BAHM Version:

PREDEVELOPED LAND USE

Name : Existing Watershed
Bypass: No

GroundWater: No

Pervious Land Use	Acres
A,Grass,Flat(0-5%)	25.2
A,Urban,Flat(0-5%)	53

Impervious Land Use	Acres
Parking,Flat(0-5%)	25.4

Element Flows To:

Surface	Interflow	Groundwater

MITIGATED LAND USE

Name : UNDEVELOPED WCHB Site
Bypass: No

GroundWater: No

Pervious Land Use	Acres
A,Grass,Flat(0-5%)	25.2

Impervious Land Use	Acres

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1,	Trapezoidal Pond 1,	

Name : Phase 1
Bypass: No

GroundWater: No

Pervious Land Use	Acres
A,Urban,Flat(0-5%)	9.1

Impervious Land Use	Acres

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1,	Trapezoidal Pond 1,	

Name : Phase 2
Bypass: No

GroundWater: No

Pervious Land Use	Acres
A,Urban,Flat(0-5%)	3.8

Impervious Land Use	Acres

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1,	Trapezoidal Pond 1,	

Name : Phase 3
Bypass: No

GroundWater: No

Pervious Land Use	Acres
A,Urban,Flat(0-5%)	4.8

Impervious Land Use	Acres

Element Flows To:

Surface	**Interflow**	**Groundwater**
Trapezoidal Pond 1,	Trapezoidal Pond 1,	

Name : Phase 4
Bypass: No

GroundWater: No

Pervious Land Use	**Acres**
A,Urban,Flat(0-5%)	**3.4**

Impervious Land Use	**Acres**

Element Flows To:

Surface	**Interflow**	**Groundwater**
Trapezoidal Pond 1,	Trapezoidal Pond 1,	

Name : Phase 5
Bypass: No

GroundWater: No

Pervious Land Use	**Acres**
A,Urban,Flat(0-5%)	**4.3**

Impervious Land Use	**Acres**

Element Flows To:

Surface	**Interflow**	**Groundwater**
Trapezoidal Pond 1,	Trapezoidal Pond 1,	

Name : Existing Subdivision
Bypass: No

GroundWater: No

Pervious Land Use	**Acres**
A,Urban,Flat(0-5%)	**53**

Impervious Land Use	**Acres**

Element Flows To:

Surface	**Interflow**	**Groundwater**
Trapezoidal Pond 1,	Trapezoidal Pond 1,	

Name : Trapezoidal Pond 1
Bottom Length: 125ft.
Bottom Width: 125ft.
Depth : 14ft.
Volume at riser head : 7.3791ft.
Side slope 1: 3 To 1
Side slope 2: 3 To 1
Side slope 3: 3 To 1
Side slope 4: 3 To 1
Discharge Structure
Riser Height: 12 ft.
Riser Diameter: 36 in.
NotchType : Rectangular
Notch Width : 3.000 ft.
Notch Height: 2.600 ft.
Orifice 1 Diameter: 6.131 in. **Elevation:** 0 ft.

Element Flows To:
Outlet 1 **Outlet 2**

Pond Hydraulic Table

Stage(ft)	Area(acr)	Volume(acr-ft)	Dschrg(cfs)	Infilt(cfs)
0.000	0.359	0.000	0.000	0.000
0.156	0.364	0.056	0.389	0.000
0.311	0.369	0.113	0.551	0.000
0.467	0.375	0.171	0.674	0.000
0.622	0.380	0.230	0.779	0.000
0.778	0.386	0.290	0.871	0.000
0.933	0.392	0.350	0.954	0.000
1.089	0.397	0.411	1.030	0.000
1.244	0.403	0.474	1.101	0.000
1.400	0.409	0.537	1.168	0.000
1.556	0.414	0.601	1.231	0.000
1.711	0.420	0.666	1.291	0.000
1.867	0.426	0.731	1.349	0.000
2.022	0.432	0.798	1.404	0.000
2.178	0.438	0.866	1.457	0.000
2.333	0.444	0.934	1.508	0.000
2.489	0.450	1.004	1.557	0.000
2.644	0.456	1.074	1.605	0.000
2.800	0.462	1.145	1.652	0.000
2.956	0.468	1.218	1.697	0.000
3.111	0.474	1.291	1.741	0.000
3.267	0.480	1.365	1.784	0.000
3.422	0.486	1.440	1.826	0.000
3.578	0.492	1.516	1.867	0.000
3.733	0.499	1.593	1.908	0.000
3.889	0.505	1.672	1.947	0.000

4.044	0.511	1.751	1.985	0.000
4.200	0.518	1.831	2.023	0.000
4.356	0.524	1.912	2.060	0.000
4.511	0.531	1.994	2.097	0.000
4.667	0.537	2.077	2.133	0.000
4.822	0.544	2.161	2.168	0.000
4.978	0.551	2.246	2.203	0.000
5.133	0.557	2.332	2.237	0.000
5.289	0.564	2.420	2.270	0.000
5.444	0.571	2.508	2.304	0.000
5.600	0.577	2.597	2.336	0.000
5.756	0.584	2.687	2.368	0.000
5.911	0.591	2.779	2.400	0.000
6.067	0.598	2.871	2.432	0.000
6.222	0.605	2.965	2.463	0.000
6.378	0.612	3.060	2.493	0.000
6.533	0.619	3.155	2.523	0.000
6.689	0.626	3.252	2.553	0.000
6.844	0.633	3.350	2.583	0.000
7.000	0.640	3.449	2.612	0.000
7.156	0.647	3.549	2.641	0.000
7.311	0.655	3.651	2.669	0.000
7.467	0.662	3.753	2.698	0.000
7.622	0.669	3.856	2.726	0.000
7.778	0.677	3.961	2.753	0.000
7.933	0.684	4.067	2.781	0.000
8.089	0.691	4.174	2.808	0.000
8.244	0.699	4.282	2.835	0.000
8.400	0.706	4.391	2.861	0.000
8.556	0.714	4.502	2.888	0.000
8.711	0.721	4.613	2.914	0.000
8.867	0.729	4.726	2.940	0.000
9.022	0.737	4.840	2.965	0.000
9.178	0.744	4.955	2.991	0.000
9.333	0.752	5.072	3.016	0.000
9.489	0.760	5.189	3.306	0.000
9.644	0.768	5.308	4.273	0.000
9.800	0.776	5.428	5.618	0.000
9.956	0.783	5.549	7.252	0.000
10.11	0.791	5.672	9.130	0.000
10.27	0.799	5.796	11.22	0.000
10.42	0.807	5.921	13.51	0.000
10.58	0.815	6.047	15.98	0.000
10.73	0.824	6.174	18.61	0.000
10.89	0.832	6.303	21.41	0.000
11.04	0.840	6.433	24.35	0.000
11.20	0.848	6.564	27.43	0.000
11.36	0.856	6.697	30.65	0.000
11.51	0.865	6.831	33.99	0.000
11.67	0.873	6.966	37.46	0.000
11.82	0.881	7.102	41.05	0.000
11.98	0.890	7.240	44.76	0.000
12.13	0.898	7.379	46.74	0.000
12.29	0.907	7.519	49.88	0.000
12.44	0.915	7.661	54.02	0.000
12.60	0.924	7.804	58.96	0.000
12.76	0.932	7.949	64.60	0.000

12.91	0.941	8.094	70.84	0.000
13.07	0.950	8.241	77.64	0.000
13.22	0.958	8.390	84.95	0.000
13.38	0.967	8.540	92.74	0.000
13.53	0.976	8.691	101.0	0.000
13.69	0.985	8.843	109.7	0.000
13.84	0.994	8.997	118.7	0.000
14.00	1.003	9.152	128.2	0.000
14.16	1.012	9.309	138.1	0.000

ANALYSIS RESULTS

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	31.8301
5 year	64.269696
10 year	68.659565
25 year	92.510761

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	13.0155
5 year	39.363604
10 year	59.017726
25 year	67.005952

Yearly Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1961	22.801	4.901
1962	17.856	2.671
1963	29.230	2.993
1964	35.551	32.341
1965	76.330	41.611
1966	29.065	9.471
1967	20.006	2.777
1968	141.664	84.495
1969	53.673	38.575
1970	46.507	38.507
1971	36.652	13.016
1972	35.367	16.046
1973	14.545	2.170
1974	87.830	65.340
1975	66.091	16.543
1976	30.705	11.537
1977	8.362	0.109
1978	10.688	0.507
1979	41.518	13.777
1980	45.562	7.839
1981	29.425	12.166
1982	18.461	3.028
1983	66.441	58.156
1984	52.214	37.299

1985	24.819	3.091
1986	15.508	2.460
1987	68.145	61.288
1988	22.062	13.072
1989	9.654	1.591
1990	18.644	2.110
1991	31.047	10.679
1992	31.830	14.088
1993	41.859	7.994
1994	30.524	22.085
1995	15.968	2.528
1996	67.962	57.423
1997	69.624	59.901
1998	36.833	25.906
1999	60.359	39.583
2000	37.169	3.099
2001	24.040	13.104
2002	28.318	3.131
2003	15.492	2.290
2004	45.359	36.647
2005	65.356	58.547

Ranked Yearly Peaks for Predeveloped and Mitigated. POC #1

Rank	**Predeveloped**	**Mitigated**
1	141.6640	84.4953
2	87.8295	65.3403
3	76.3295	61.2880
4	69.6240	59.9009
5	68.1452	58.5467
6	67.9620	58.1564
7	66.4410	57.4225
8	66.0910	41.6112
9	65.3560	39.5828
10	60.3590	38.5745
11	53.6728	38.5072
12	52.2144	37.2988
13	46.5070	36.6470
14	45.5624	32.3408
15	45.3591	25.9055
16	41.8587	22.0846
17	41.5184	16.5429
18	37.1691	16.0458
19	36.8329	14.0883
20	36.6523	13.7768
21	35.5506	13.1042
22	35.3673	13.0719
23	31.8301	13.0155
24	31.0465	12.1663
25	30.7053	11.5365
26	30.5243	10.6787
27	29.4245	9.4707
28	29.2295	7.9943
29	29.0649	7.8392
30	28.3175	4.9008
31	24.8190	3.1308
32	24.0398	3.0989

33	22.8012	3.0909
34	22.0618	3.0277
35	20.0062	2.9926
36	18.6437	2.7768
37	18.4605	2.6708
38	17.8556	2.5278
39	15.9682	2.4599
40	15.5084	2.2897
41	15.4916	2.1704
42	14.5454	2.1096
43	10.6883	1.5909
44	9.6543	0.5066
45	8.3621	0.1088

POC #1
The Facility PASSED

The Facility PASSED.

Flow(CFS)	**Predev**	**Dev**	**Percentage**	**Pass/Fail**
3.1830	2914	546	18	Pass
3.8444	2354	362	15	Pass
4.5058	1885	301	15	Pass
5.1671	1596	265	16	Pass
5.8285	1368	240	17	Pass
6.4899	1175	213	18	Pass
7.1513	1024	190	18	Pass
7.8127	912	171	18	Pass
8.4740	810	156	19	Pass
9.1354	738	148	20	Pass
9.7968	676	143	21	Pass
10.4582	628	129	20	Pass
11.1196	562	121	21	Pass
11.7809	519	116	22	Pass
12.4423	476	110	23	Pass
13.1037	437	100	22	Pass
13.7651	400	96	24	Pass
14.4265	364	90	24	Pass
15.0878	335	84	25	Pass
15.7492	310	79	25	Pass
16.4106	285	75	26	Pass
17.0720	256	71	27	Pass
17.7334	242	70	28	Pass
18.3947	226	67	29	Pass
19.0561	214	64	29	Pass
19.7175	195	61	31	Pass
20.3789	175	60	34	Pass
21.0403	159	56	35	Pass
21.7016	151	52	34	Pass
22.3630	143	50	34	Pass
23.0244	135	47	34	Pass
23.6858	127	45	35	Pass
24.3471	116	44	37	Pass
25.0085	110	44	40	Pass
25.6699	101	43	42	Pass
26.3313	94	40	42	Pass

26.9927	93	38	40	Pass
27.6540	89	38	42	Pass
28.3154	86	36	41	Pass
28.9768	81	35	43	Pass
29.6382	71	31	43	Pass
30.2996	70	30	42	Pass
30.9609	66	29	43	Pass
31.6223	63	29	46	Pass
32.2837	57	27	47	Pass
32.9451	54	26	48	Pass
33.6065	54	26	48	Pass
34.2678	50	26	52	Pass
34.9292	49	25	51	Pass
35.5906	46	24	52	Pass
36.2520	45	24	53	Pass
36.9134	43	22	51	Pass
37.5747	42	21	50	Pass
38.2361	41	21	51	Pass
38.8975	40	18	45	Pass
39.5589	37	17	45	Pass
40.2203	36	15	41	Pass
40.8816	36	13	36	Pass
41.5430	33	12	36	Pass
42.2044	32	11	34	Pass
42.8658	32	11	34	Pass
43.5271	31	11	35	Pass
44.1885	29	10	34	Pass
44.8499	29	10	34	Pass
45.5113	27	10	37	Pass
46.1727	25	10	40	Pass
46.8340	24	10	41	Pass
47.4954	24	10	41	Pass
48.1568	24	10	41	Pass
48.8182	24	10	41	Pass
49.4796	21	10	47	Pass
50.1409	21	10	47	Pass
50.8023	21	10	47	Pass
51.4637	21	10	47	Pass
52.1251	20	9	45	Pass
52.7865	19	9	47	Pass
53.4478	19	9	47	Pass
54.1092	18	9	50	Pass
54.7706	17	9	52	Pass
55.4320	14	9	64	Pass
56.0934	14	9	64	Pass
56.7547	14	9	64	Pass
57.4161	14	9	64	Pass
58.0775	14	7	50	Pass
58.7389	13	5	38	Pass
59.4003	13	5	38	Pass
60.0616	13	4	30	Pass
60.7230	12	4	33	Pass
61.3844	12	3	25	Pass
62.0458	10	3	30	Pass
62.7072	10	3	30	Pass
63.3685	10	3	30	Pass
64.0299	10	3	30	Pass

64.6913	10	3	30	Pass
65.3527	10	2	20	Pass
66.0140	9	2	22	Pass
66.6754	6	2	33	Pass
67.3368	6	2	33	Pass
67.9982	5	2	40	Pass
68.6596	4	2	50	Pass

Perlnd and Implnd Changes

No changes have been made.

Bay Area Hydrology Model
PROJECT REPORT

Project Name: **PITTSBURG/ BAY** POINT - DET BASIN STUDY w/ WCHB DEVELOPMENT
Site Address: **PMC - Development**
City : **Pittsburg**
Report Date : 1/27/2011
Gage : LIVERMORE (Equivalent to Pittsburg Mean Seasonal Precipitation)
Data Start : 1959/10/01
Data End : 2004/09/30
Precip Scale: 1.67
BAHM Version:

PREDEVELOPED LAND USE

Name : Existing Watershed
Bypass: No

GroundWater: No

Pervious Land Use	Acres
A,Grass,Flat(0-5%)	25.2
A,Urban,Flat(0-5%)	53

Impervious Land Use	Acres
Parking,Flat(0-5%)	25.4

Element Flows To:

Surface	Interflow	Groundwater

MITIGATED LAND USE

Name : WCHB Site
Bypass: No

GroundWater: No

Pervious Land Use	Acres
A,Urban,Flat(0-5%)	25.2

Impervious Land Use	Acres

Element Flows To:

Surface **Interflow** **Groundwater**
Trapezoidal Pond 1, Trapezoidal Pond 1,

Name : Phase 1
Bypass: No

GroundWater: No

Pervious Land Use	Acres
A,Urban,Flat(0-5%)	9.1

Impervious Land Use	Acres

Element Flows To:
Surface **Interflow** **Groundwater**
Trapezoidal Pond 1, Trapezoidal Pond 1,

Name : Phase 2
Bypass: No

GroundWater: No

Pervious Land Use	Acres
A,Urban,Flat(0-5%)	3.8

Impervious Land Use	Acres

Element Flows To:
Surface **Interflow** **Groundwater**
Trapezoidal Pond 1, Trapezoidal Pond 1,

Name : Phase 3
Bypass: No

GroundWater: No

Pervious Land Use	Acres
A,Urban,Flat(0-5%)	4.8

Impervious Land Use	Acres

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1,	Trapezoidal Pond 1,	

Name : Phase 4
Bypass: No

GroundWater: No

Pervious Land Use	Acres
A,Urban,Flat(0-5%)	**3.4**

Impervious Land Use	Acres

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1,	Trapezoidal Pond 1,	

Name : Phase 5
Bypass: No

GroundWater: No

Pervious Land Use	Acres
A,Urban,Flat(0-5%)	**4.3**

Impervious Land Use	Acres

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1,	Trapezoidal Pond 1,	

Name : Existing Subdivision
Bypass: No

GroundWater: No

Pervious Land Use	Acres
A,Urban,Flat(0-5%)	**53**

Impervious Land Use	Acres

Element Flows To:

Surface	**Interflow**	**Groundwater**
Trapezoidal Pond 1,	Trapezoidal Pond 1,	

Name : Trapezoidal Pond 1
Bottom Length: 150ft.
Bottom Width: 150ft.
Depth : 14ft.
Volume at riser head : 9.8010ft.
Side slope 1: 3 To 1
Side slope 2: 3 To 1
Side slope 3: 3 To 1
Side slope 4: 3 To 1
Discharge Structure
Riser Height: 12 ft.
Riser Diameter: 36 in.
NotchType : Rectangular
Notch Width : 3.000 ft.
Notch Height: 2.600 ft.
Orifice 1 Diameter: 6.131 in. **Elevation:** 0 ft.

Element Flows To:
Outlet 1 **Outlet 2**

Pond Hydraulic Table

Stage(ft)	Area(acr)	Volume(acr-ft)	Dschrg(cfs)	Infilt(cfs)
0.000	0.517	0.000	0.000	0.000
0.156	0.523	0.081	0.389	0.000
0.311	0.529	0.163	0.551	0.000
0.467	0.536	0.246	0.674	0.000
0.622	0.543	0.329	0.779	0.000
0.778	0.549	0.414	0.871	0.000
0.933	0.556	0.500	0.954	0.000
1.089	0.563	0.587	1.030	0.000
1.244	0.569	0.675	1.101	0.000
1.400	0.576	0.764	1.168	0.000
1.556	0.583	0.855	1.231	0.000
1.711	0.590	0.946	1.291	0.000
1.867	0.597	1.038	1.349	0.000
2.022	0.603	1.131	1.404	0.000
2.178	0.610	1.226	1.457	0.000
2.333	0.617	1.321	1.508	0.000
2.489	0.624	1.418	1.557	0.000
2.644	0.632	1.516	1.605	0.000
2.800	0.639	1.614	1.652	0.000
2.956	0.646	1.714	1.697	0.000
3.111	0.653	1.815	1.741	0.000
3.267	0.660	1.917	1.784	0.000
3.422	0.668	2.021	1.826	0.000
3.578	0.675	2.125	1.867	0.000
3.733	0.682	2.231	1.908	0.000
3.889	0.690	2.337	1.947	0.000

4.044	0.697	2.445	1.985	0.000
4.200	0.705	2.554	2.023	0.000
4.356	0.712	2.665	2.060	0.000
4.511	0.720	2.776	2.097	0.000
4.667	0.727	2.888	2.133	0.000
4.822	0.735	3.002	2.168	0.000
4.978	0.743	3.117	2.203	0.000
5.133	0.750	3.233	2.237	0.000
5.289	0.758	3.351	2.270	0.000
5.444	0.766	3.469	2.304	0.000
5.600	0.774	3.589	2.336	0.000
5.756	0.782	3.710	2.368	0.000
5.911	0.790	3.832	2.400	0.000
6.067	0.798	3.956	2.432	0.000
6.222	0.806	4.080	2.463	0.000
6.378	0.814	4.206	2.493	0.000
6.533	0.822	4.333	2.523	0.000
6.689	0.830	4.462	2.553	0.000
6.844	0.838	4.592	2.583	0.000
7.000	0.846	4.723	2.612	0.000
7.156	0.855	4.855	2.641	0.000
7.311	0.863	4.988	2.669	0.000
7.467	0.871	5.123	2.698	0.000
7.622	0.880	5.259	2.726	0.000
7.778	0.888	5.397	2.753	0.000
7.933	0.896	5.536	2.781	0.000
8.089	0.905	5.676	2.808	0.000
8.244	0.913	5.817	2.835	0.000
8.400	0.922	5.960	2.861	0.000
8.556	0.931	6.104	2.888	0.000
8.711	0.939	6.250	2.914	0.000
8.867	0.948	6.396	2.940	0.000
9.022	0.957	6.544	2.965	0.000
9.178	0.965	6.694	2.991	0.000
9.333	0.974	6.845	3.016	0.000
9.489	0.983	6.997	3.306	0.000
9.644	0.992	7.151	4.273	0.000
9.800	1.001	7.306	5.618	0.000
9.956	1.010	7.462	7.252	0.000
10.11	1.019	7.620	9.130	0.000
10.27	1.028	7.779	11.22	0.000
10.42	1.037	7.940	13.51	0.000
10.58	1.046	8.102	15.98	0.000
10.73	1.055	8.265	18.61	0.000
10.89	1.064	8.430	21.41	0.000
11.04	1.074	8.596	24.35	0.000
11.20	1.083	8.764	27.43	0.000
11.36	1.092	8.933	30.65	0.000
11.51	1.102	9.104	33.99	0.000
11.67	1.111	9.276	37.46	0.000
11.82	1.121	9.449	41.05	0.000
11.98	1.130	9.624	44.76	0.000
12.13	1.140	9.801	46.74	0.000
12.29	1.149	9.979	49.88	0.000
12.44	1.159	10.16	54.02	0.000
12.60	1.168	10.34	58.96	0.000
12.76	1.178	10.52	64.60	0.000

12.91	1.188	10.71	70.84	0.000
13.07	1.198	10.89	77.64	0.000
13.22	1.207	11.08	84.95	0.000
13.38	1.217	11.27	92.74	0.000
13.53	1.227	11.46	101.0	0.000
13.69	1.237	11.65	109.7	0.000
13.84	1.247	11.84	118.7	0.000
14.00	1.257	12.04	128.2	0.000
14.16	1.267	12.23	138.1	0.000

ANALYSIS RESULTS

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	31.8301
5 year	64.269696
10 year	68.659565
25 year	92.510761

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	16.3773
5 year	45.883778
10 year	63.920013
25 year	74.259343

Yearly Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1961	22.801	7.629
1962	17.856	2.884
1963	29.230	3.401
1964	35.551	36.409
1965	76.330	59.130
1966	29.065	12.754
1967	20.006	3.007
1968	141.664	89.791
1969	53.673	46.527
1970	46.507	43.569
1971	36.652	17.472
1972	35.367	19.271
1973	14.545	2.521
1974	87.830	72.780
1975	66.091	19.772
1976	30.705	15.560
1977	8.362	0.132
1978	10.688	0.617
1979	41.518	16.529
1980	45.562	11.506
1981	29.425	16.296
1982	18.461	5.135
1983	66.441	61.475

1984	52.214	42.319
1985	24.819	7.893
1986	15.508	2.675
1987	68.145	64.413
1988	22.062	15.642
1989	9.654	1.792
1990	18.644	2.324
1991	31.047	16.856
1992	31.830	16.377
1993	41.859	15.712
1994	30.524	26.540
1995	15.968	2.822
1996	67.962	63.273
1997	69.624	64.894
1998	36.833	31.368
1999	60.359	42.956
2000	37.169	3.836
2001	24.040	19.853
2002	28.318	8.166
2003	15.492	2.551
2004	45.359	41.324
2005	65.356	63.657

Ranked Yearly Peaks for Predeveloped and Mitigated. POC #1

Rank	**Predeveloped**	**Mitigated**
1	141.6640	89.7914
2	87.8295	72.7801
3	76.3295	64.8943
4	69.6240	64.4126
5	68.1452	63.6573
6	67.9620	63.2730
7	66.4410	61.4749
8	66.0910	59.1296
9	65.3560	46.5268
10	60.3590	43.5689
11	53.6728	42.9563
12	52.2144	42.3192
13	46.5070	41.3236
14	45.5624	36.4086
15	45.3591	31.3682
16	41.8587	26.5403
17	41.5184	19.8529
18	37.1691	19.7720
19	36.8329	19.2707
20	36.6523	17.4722
21	35.5506	16.8562
22	35.3673	16.5290
23	31.8301	16.3773
24	31.0465	16.2958
25	30.7053	15.7120
26	30.5243	15.6423
27	29.4245	15.5604
28	29.2295	12.7540
29	29.0649	11.5062
30	28.3175	8.1657
31	24.8190	7.8928

32	24.0398	7.6287
33	22.8012	5.1345
34	22.0618	3.8364
35	20.0062	3.4010
36	18.6437	3.0068
37	18.4605	2.8839
38	17.8556	2.8222
39	15.9682	2.6748
40	15.5084	2.5511
41	15.4916	2.5207
42	14.5454	2.3239
43	10.6883	1.7919
44	9.6543	0.6165
45	8.3621	0.1320

POC #1
The Facility PASSED

The Facility PASSED.

Flow(CFS)	Predev	Dev	Percentage	Pass/Fail
3.1830	2914	678	23	Pass
3.8444	2354	467	19	Pass
4.5058	1885	409	21	Pass
5.1671	1596	354	22	Pass
5.8285	1368	319	23	Pass
6.4899	1175	288	24	Pass
7.1513	1024	259	25	Pass
7.8127	912	238	26	Pass
8.4740	810	219	27	Pass
9.1354	738	198	26	Pass
9.7968	676	185	27	Pass
10.4582	628	175	27	Pass
11.1196	562	166	29	Pass
11.7809	519	152	29	Pass
12.4423	476	146	30	Pass
13.1037	437	134	30	Pass
13.7651	400	132	33	Pass
14.4265	364	125	34	Pass
15.0878	335	120	35	Pass
15.7492	310	111	35	Pass
16.4106	285	105	36	Pass
17.0720	256	98	38	Pass
17.7334	242	93	38	Pass
18.3947	226	88	38	Pass
19.0561	214	83	38	Pass
19.7175	195	79	40	Pass
20.3789	175	76	43	Pass
21.0403	159	72	45	Pass
21.7016	151	69	45	Pass
22.3630	143	66	46	Pass
23.0244	135	65	48	Pass
23.6858	127	61	48	Pass
24.3471	116	59	50	Pass
25.0085	110	56	50	Pass
25.6699	101	53	52	Pass

26.3313	94	51	54	Pass
26.9927	93	50	53	Pass
27.6540	89	45	50	Pass
28.3154	86	43	50	Pass
28.9768	81	42	51	Pass
29.6382	71	41	57	Pass
30.2996	70	40	57	Pass
30.9609	66	39	59	Pass
31.6223	63	35	55	Pass
32.2837	57	35	61	Pass
32.9451	54	33	61	Pass
33.6065	54	33	61	Pass
34.2678	50	32	64	Pass
34.9292	49	30	61	Pass
35.5906	46	29	63	Pass
36.2520	45	29	64	Pass
36.9134	43	27	62	Pass
37.5747	42	27	64	Pass
38.2361	41	27	65	Pass
38.8975	40	27	67	Pass
39.5589	37	25	67	Pass
40.2203	36	25	69	Pass
40.8816	36	24	66	Pass
41.5430	33	23	69	Pass
42.2044	32	22	68	Pass
42.8658	32	20	62	Pass
43.5271	31	18	58	Pass
44.1885	29	16	55	Pass
44.8499	29	15	51	Pass
45.5113	27	15	55	Pass
46.1727	25	14	56	Pass
46.8340	24	13	54	Pass
47.4954	24	13	54	Pass
48.1568	24	12	50	Pass
48.8182	24	12	50	Pass
49.4796	21	12	57	Pass
50.1409	21	12	57	Pass
50.8023	21	12	57	Pass
51.4637	21	12	57	Pass
52.1251	20	12	60	Pass
52.7865	19	12	63	Pass
53.4478	19	12	63	Pass
54.1092	18	12	66	Pass
54.7706	17	12	70	Pass
55.4320	14	12	85	Pass
56.0934	14	11	78	Pass
56.7547	14	11	78	Pass
57.4161	14	11	78	Pass
58.0775	14	10	71	Pass
58.7389	13	10	76	Pass
59.4003	13	9	69	Pass
60.0616	13	9	69	Pass
60.7230	12	9	75	Pass
61.3844	12	9	75	Pass
62.0458	10	7	70	Pass
62.7072	10	7	70	Pass
63.3685	10	6	60	Pass

64.0299	10	5	50	Pass
64.6913	10	4	40	Pass
65.3527	10	3	30	Pass
66.0140	9	3	33	Pass
66.6754	6	3	50	Pass
67.3368	6	3	50	Pass
67.9982	5	3	60	Pass
68.6596	4	3	75	Pass

Perlnd and Implnd Changes

No changes have been made.

APPENDIX G: BIOLOGICAL RESOURCES ANALYSIS

APPENDIX G-1:
RESULTS OF THE DATABASE SEARCHES FOR THE CITY OF PITTSBURG BART MASTER PLAN

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

April 27, 2009

Document Number: 090427103038

Angela Marie Calderaro
PMC
2729 Prospect Park Drive, Suite 200
Rancho Cordova, CA 95670

Subject: Species List for Pittsburg/Bay Point BART station Master Plan

Dear: Interested party

We are sending this official species list in response to your April 27, 2009 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area*. For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be July 26, 2009.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found at www.fws.gov/sacramento/es/branches.htm.

Endangered Species Division

U.S. Fish & Wildlife Service

Sacramento Fish & Wildlife Office

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 090427103038

Database Last Updated: January 29, 2009

Quad Lists

Listed Species

Invertebrates

Apodemia mormo langei
- Lange's metalmark butterfly (E)

Branchinecta conservatio
- Conservancy fairy shrimp (E)
- Critical habitat, Conservancy fairy shrimp (X)

Branchinecta longiantenna
- longhorn fairy shrimp (E)

Branchinecta lynchi
- Critical habitat, vernal pool fairy shrimp (X)
- vernal pool fairy shrimp (T)

Desmocerus californicus dimorphus
- valley elderberry longhorn beetle (T)

Elaphrus viridis
- Critical habitat, delta green ground beetle (X)
- delta green ground beetle (T)

Incisalia mossii bayensis
- San Bruno elfin butterfly (E)

Lepidurus packardi
- Critical habitat, vernal pool tadpole shrimp (X)
- vernal pool tadpole shrimp (E)

Speyeria callippe callippe
- callippe silverspot butterfly (E)

Syncaris pacifica
- California freshwater shrimp (E)

Fish

Acipenser medirostris
- green sturgeon (T) (NMFS)

Hypomesus transpacificus
- Critical habitat, delta smelt (X)
- delta smelt (T)

Oncorhynchus mykiss
- Central Valley steelhead (T) (NMFS)

Critical habitat, Central Valley steelhead (X) (NMFS)

Oncorhynchus tshawytscha

Central Valley spring-run chinook salmon (T) (NMFS)
Critical Habitat, Central Valley spring-run chinook (X) (NMFS)
Critical habitat, winter-run chinook salmon (X) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense

California tiger salamander, central population (T)
Critical habitat, CA tiger salamander, central population (X)

Rana aurora draytonii

California red-legged frog (T)
Critical habitat, California red-legged frog (X)

Reptiles

Masticophis lateralis euryxanthus

Alameda whipsnake [=striped racer] (T)
Critical habitat, Alameda whipsnake (X)

Thamnophis gigas

giant garter snake (T)

Birds

Pelecanus occidentalis californicus

California brown pelican (E)

Rallus longirostris obsoletus

California clapper rail (E)

Sternula antillarum (=Sterna, =albifrons) browni

California least tern (E)

Mammals

Reithrodontomys raviventris

salt marsh harvest mouse (E)

Vulpes macrotis mutica

San Joaquin kit fox (E)

Plants

Amsinckia grandiflora

large-flowered fiddleneck (E)

Cirsium hydrophilum var. hydrophilum

Suisun thistle (E)

Cordylanthus mollis ssp. mollis

soft bird's-beak (E)

Erysimum capitatum ssp. angustatum

Contra Costa wallflower (E)
Critical Habitat, Contra Costa wallflower (X)

Lasthenia conjugens

Contra Costa goldfields (E)
Critical habitat, Contra Costa goldfields (X)

Neostapfia colusana

Colusa grass (T)

Oenothera deltoides ssp. howellii

Antioch Dunes evening-primrose (E)

Critical habitat, Antioch Dunes evening-primrose (X)

Proposed Species

Amphibians

Rana aurora draytonii

Critical habitat, California red-legged frog (PX)

Plants

Cirsium hydrophilum var. hydrophilum

Critical habitat, Suisun thistle (PX)

Cordylanthus mollis ssp. mollis

Critical habitat, soft bird's-beak (PX)

Quads Containing Listed, Proposed or Candidate Species:

ANTIOCH SOUTH (464A)

CLAYTON (464B)

WALNUT CREEK (465A)

BIRDS LANDING (481A)

DENVERTON (481B)

HONKER BAY (481C)

ANTIOCH NORTH (481D)

FAIRFIELD SOUTH (482A)

VINE HILL (482D)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.

Critical Habitat - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be July 26, 2009.

California Department of Fish and Game
Natural Diversity Database
Selected Elements by Scientific Name - Landscape
Pittsburg / Bay Point BART station Master Plan

	Scientific Name	Common Name	Element Code	Federal Status	State Status	Global Rank	State Rank	CNPS	CDFG
1	Actinemys marmorata	western pond turtle	ARAAD02030			G3G4	S3		SC
2	Actinemys marmorata marmorata	northwestern pond turtle	ARAAD02031			G3G4T3	S3		SC
3	Agelaius tricolor	tricolored blackbird	ABPBXB0020			G2G3	S2		SC
4	Ambystoma californiense	California tiger salamander	AAAAA01180	Threatened	unknown code...	G2G3	S2S3		SC
5	Amsinckia grandiflora	large-flowered fiddleneck	PDBOR01050	Endangered	Endangered	G1	S1.1	1B.1	
6	Andrena blennospermatis	Blennosperma vernal pool andrenid bee	IIHYM35030			G2	S2		
7	Anniella pulchra pulchra	silvery legless lizard	ARACC01012			G3G4T3T4Q	S3		SC
8	Anomobryum julaceum	slender silver moss	NBMUS80010			G4G5	S1.3	2.2	
9	Anthicus antiochensis	Antioch Dunes anthicid beetle	IICOL49020			G1	S1		
10	Antrozous pallidus	pallid bat	AMACC10010			G5	S3		SC
11	Apodemia mormo langei	Lange's metalmark butterfly	IILEPH7012	Endangered		G5T1	S1		
12	Aquila chrysaetos	golden eagle	ABNKC22010			G5	S3		
13	Archoplites interruptus	Sacramento perch	AFCQB07010			G3	S1		SC
14	Arctostaphylos auriculata	Mt. Diablo manzanita	PDERI04040			G2	S2.2	1B.3	
15	Arctostaphylos manzanita ssp. laevigata	Contra Costa manzanita	PDERI04273			G5T2	S2	1B.2	
16	Asio flammeus	short-eared owl	ABNSB13040			G5	S3		SC
17	Astragalus tener var. tener	alkali milk-vetch	PDFAB0F8R1			G1T1	S1.1	1B.2	
18	Athene cunicularia	burrowing owl	ABNSB10010			G4	S2		SC
19	Atriplex cordulata	heartscale	PDCHE040B0			G2?	S2.2?	1B.2	
20	Atriplex depressa	brittlescale	PDCHE042L0			G2Q	S2.2	1B.2	
21	Atriplex joaquiniana	San Joaquin spearscale	PDCHE041F3			G2	S2.1	1B.2	
22	Blepharizonia plumosa	big tarplant	PDAST1C011			G1	S1.1	1B.1	
23	Branchinecta conservatio	Conservancy fairy shrimp	ICBRA03010	Endangered		G1	S1		
24	Branchinecta lynchi	vernal pool fairy shrimp	ICBRA03030	Threatened		G3	S2S3		
25	Branchinecta mesovallensis	midvalley fairy shrimp	ICBRA03150			G2	S2		
26	Buteo regalis	ferruginous hawk	ABNKC19120			G4	S3S4		
27	Buteo swainsoni	Swainson's hawk	ABNKC19070		Threatened	G5	S2		
28	California macrophylla	round-leaved filaree	PDGER01070			G3	S3.1	1B.1	
29	Callophrys mossii bayensis	San Bruno elfin butterfly	IILEPE2202	Endangered		G4T1	S1		
30	Calochortus pulchellus	Mt. Diablo fairy-lantern	PMLIL0D160			G2	S2.1	1B.2	
31	Campanula exigua	chaparral harebell	PDCAM020A0			G2	S2.2	1B.2	

	Scientific Name	Common Name	Element Code	Federal Status	State Status	Global Rank	State Rank	CNPS	CDFG
32	Centromadia parryi ssp. congdonii	Congdon's tarplant	PDAST4R0P1			G4T3	S3.2	1B.2	
33	Centromadia parryi ssp. parryi	pappose tarplant	PDAST4R0P2			G4T2	S2.2	1B.2	
34	Charadrius montanus	mountain plover	ABNNB03100			G2	S2?		SC
35	Circus cyaneus	northern harrier	ABNKC11010			G5	S3		SC
36	Cirsium hydrophilum var. hydrophilum	Suisun thistle	PDAST2E1G1	Endangered		G1T1	S1.1	1B.1	
37	Coastal Brackish Marsh	Coastal Brackish Marsh	CTT52200CA			G2	S2.1		
38	Coelus gracilis	San Joaquin dune beetle	IICOL4A020			G1	S1		
39	Cordylanthus mollis ssp. hispidus	hispid bird's-beak	PDSCR0J0D1			G2T2	S2.1	1B.1	
40	Cordylanthus mollis ssp. mollis	soft bird's-beak	PDSCR0J0D2	Endangered	Rare	G2T1	S1.1	1B.2	
41	Cordylanthus nidularius	Mt. Diablo bird's-beak	PDSCR0J0F0		Rare	G1	S1.2	1B.1	
42	Cryptantha hooveri	Hoover's cryptantha	PDBOR0A190			GH	SH	1A	
43	Danaus plexippus	monarch butterfly	IILEPP2010			G5	S3		
44	Delphinium californicum ssp. interius	Hospital Canyon larkspur	PDRAN0B0A2			G3T2?	S2?	1B.2	
45	Desmocerus californicus dimorphus	valley elderberry longhorn beetle	IICOL48011	Threatened		G3T2	S2		
46	Didymodon norrisii	Norris' beard moss	NBMUS2C0H0			G2G3	S2.2	2.2	
47	Dipodomys heermanni berkeleyensis	Berkeley kangaroo rat	AMAFD03061			G3G4T1	S1		
48	Downingia pusilla	dwarf downingia	PDCAM060C0			G3	S3.1	2.2	
49	Dumontia oregonensis	hairy water flea	ICBRA23010			G1G3	S1		
50	Efferia antiochi	Antioch efferian robberfly	IIDIP07010			G1G3	S1S3		
51	Elanus leucurus	white-tailed kite	ABNKC06010			G5	S3		
52	Elaphrus viridis	Delta green ground beetle	IICOL36010	Threatened		G1	S1		
53	Eriastrum brandegeeae	Brandegee's eriastrum	PDPLM03020			G3	S3.2	1B.2	
54	Eriogonum truncatum	Mt. Diablo buckwheat	PDPGN085Z0			G1	S1.1	1B.1	
55	Erysimum capitatum var. angustatum	Contra Costa wallflower	PDBRA16052	Endangered	Endangered	G5T1	S1.1	1B.1	
56	Eschscholzia rhombipetala	diamond-petaled California poppy	PDPAP0A0D0			G1	S1.1	1B.1	
57	Eucerceris ruficeps	redheaded sphecid wasp	IIHYM18010			G1G3	S1S2		
58	Fritillaria liliacea	fragrant fritillary	PMLIL0V0C0			G2	S2.2	1B.2	
59	Geothlypis trichas sinuosa	saltmarsh common yellowthroat	ABPBX1201A			G5T2	S2		SC
60	Helianthella castanea	Diablo helianthella	PDAST4M020			G3	S3.2	1B.2	
61	Helminthoglypta nickliniana bridgesi	Bridges' coast range shoulderband	IMGASC2362			G2T1	S1		
62	Hesperolinon breweri	Brewer's western flax	PDLIN01030			G2	S2.2	1B.2	
63	Hypomesus transpacificus	Delta smelt	AFCHB01040	Threatened	Threatened	G1	S1		
64	Idiostatus middlekauffi	Middlekauff's shieldback katydid	IIORT31010			G1G2	S1		

	Scientific Name	Common Name	Element Code	Federal Status	State Status	Global Rank	State Rank	CNPS	CDFG
65	Isocoma arguta	Carquinez goldenbush	PDAST57050			G1	S1.1	1B.1	
66	Lasiurus blossevillii	western red bat	AMACC05060			G5	S3?		SC
67	Lasiurus cinereus	hoary bat	AMACC05030			G5	S4?		
68	Lasthenia conjugens	Contra Costa goldfields	PDAST5L040	Endangered		G1	S1.1	1B.1	
69	Laterallus jamaicensis coturniculus	California black rail	ABNME03041		Threatened	G4T1	S1		
70	Lathyrus jepsonii var. jepsonii	Delta tule pea	PDFAB250D2			G5T2	S2.2	1B.2	
71	Legenere limosa	legenere	PDCAM0C010			G2	S2.2	1B.1	
72	Lepidurus packardi	vernal pool tadpole shrimp	ICBRA10010	Endangered		G3	S2S3		
73	Lilaeopsis masonii	Mason's lilaeopsis	PDAPI19030		Rare	G3	S3.1	1B.1	
74	Limosella subulata	Delta mudwort	PDSCR10050			G4?Q	S2.1	2.1	
75	Linderiella occidentalis	California linderiella	ICBRA06010			G3	S2S3		
76	Lytta molesta	molestan blister beetle	IICOL4C030			G2	S2		
77	Madia radiata	showy golden madia	PDAST650E0			G2	S2.1	1B.1	
78	Malacothamnus hallii	Hall's bush-mallow	PDMAL0Q0F0			G1Q	S1.2	1B.2	
79	Masticophis lateralis euryxanthus	Alameda whipsnake	ARADB21031	Threatened	Threatened	G4T2	S2		
80	Melospiza melodia maxillaris	Suisun song sparrow	ABPBXA301K			G5T2	S2		SC
81	Metapogon hurdi	Hurd's metapogon robberfly	IIDIP08010			G1G3	S1S3		
82	Monardella villosa ssp. globosa	robust monardella	PDLAM180P7			G5T2	S2.2	1B.2	
83	Myrmosula pacifica	Antioch multilid wasp	IIHYM15010			GH	SH		
84	Navarretia gowenii	Lime Ridge navarretia	PDPLM0C120			G1	S1	1B.1	
85	Northern Claypan Vernal Pool	Northern Claypan Vernal Pool	CTT44120CA			G1	S1.1		
86	Nyctinomops macrotis	big free-tailed bat	AMACD04020			G5	S2		SC
87	Oenothera deltoides ssp. howellii	Antioch Dunes evening-primrose	PDONA0C0B4	Endangered	Endangered	G5T1	S1.1	1B.1	
88	Oncorhynchus tshawytscha winter-run	chinook salmon winter-run	AFCHA0205B	Endangered	Endangered	G5	S1		
89	Perdita scitula antiochensis	Antioch andrenid bee	IIHYM01031			G1T1	S1		
90	Perognathus inornatus inornatus	San Joaquin pocket mouse	AMAFD01061			G4T2T3	S2S3		
91	Phacelia phacelioides	Mt. Diablo phacelia	PDHYD0C3Q0			G1	S1.2	1B.2	
92	Phalacrocorax auritus	double-crested cormorant	ABNFD01020			G5	S3		
93	Philanthus nasalis	Antioch specid wasp	IIHYM20010			G1	S1		
94	Phrynosoma coronatum (frontale population)	coast (California) horned lizard	ARACF12022			G4G5	S3S4		SC
95	Plagiobothrys hystriculus	bearded popcorn-flower	PDBOR0V0H0			G1	S1.1	1B.1	
96	Pogonichthys macrolepidotus	Sacramento splittail	AFCJB34020			G2	S2		SC

	Scientific Name	Common Name	Element Code	Federal Status	State Status	Global Rank	State Rank	CNPS	CDFG
97	Potamogeton filiformis	slender-leaved pondweed	PMPOT03090			G5	S1S2	2.2	
98	Rallus longirostris obsoletus	California clapper rail	ABNME05016	Endangered	Endangered	G5T1	S1		
99	Rana draytonii	California red-legged frog	AAABH01022	Threatened		G4T2T3	S2S3		SC
100	Reithrodontomys raviventris	salt-marsh harvest mouse	AMAFF02040	Endangered	Endangered	G1G2	S1S2		
101	Sanicula saxatilis	rock sanicle	PDAPI1Z0H0		Rare	G2	S2.2	1B.2	
102	Senecio aphanactis	chaparral ragwort	PDAST8H060			G3?	S1.2	2.2	
103	Serpentine Bunchgrass	Serpentine Bunchgrass	CTT42130CA			G2	S2.2		
104	Sorex ornatus sinuosus	Suisun shrew	AMABA01103			G5T1	S1		SC
105	Sphecodogastra antiochensis	Antioch Dunes halcitid bee	IIHYM78010			G1	S1		
106	Stabilized Interior Dunes	Stabilized Interior Dunes	CTT23100CA			G1	S1.1		
107	Sternula antillarum browni	California least tern	ABNNM08103	Endangered	Endangered	G4T2T3Q	S2S3		
108	Streptanthus albidus ssp. peramoenus	most beautiful jewel-flower	PDBRA2G012			G2T2	S2.2	1B.2	
109	Streptanthus hispidus	Mt. Diablo jewel-flower	PDBRA2G0M0			G1	S1.2	1B.3	
110	Symphyotrichum lentum	Suisun Marsh aster	PDASTE8470			G2	S2.2	1B.2	
111	Taxidea taxus	American badger	AMAJF04010			G5	S4		SC
112	Thamnophis gigas	giant garter snake	ARADB36150	Threatened	Threatened	G2G3	S2S3		
113	Triquetrella californica	coastal triquetrella	NBMUS7S010			G1	S1.2	1B.2	
114	Tropidocarpum capparideum	caper-fruited tropidocarpum	PDBRA2R010			G1	S1.1	1B.1	
115	Valley Needlegrass Grassland	Valley Needlegrass Grassland	CTT42110CA			G1	S3.1		
116	Viburnum ellipticum	oval-leaved viburnum	PDCPR07080			G5	S2.3	2.3	
117	Vulpes macrotis mutica	San Joaquin kit fox	AMAJA03041	Endangered	Threatened	G4T2T3	S2S3		

CNPS California Native Plant Society — Inventory of Rare and Endangered Plants

v7-09b 4-10-09

Status: search results - Mon, Apr. 27, 2009 10:52 c

{QUADS_123} =~ m/481C|464A|464B|482D|482A|465A|481D|481/ Search

Tip: Want to search by county? Try the **county index**.[all tips and help.][search history]

Your Quad Selection: Honker Bay (481C) 3812118, Antioch South (464A) 3712187, Clayton (464B) 3712188, Vine Hill (482D) 3812211, Fairfield South (482A) 3812221, Walnut Creek (465A) 3712281, Antioch North (481D) 3812117, Birds Landing (481A) 3812127, Denverton (481B) 3812128

Hits 1 to 50 of 59

Requests that specify topo quads will return only Lists 1-3.

To save selected records for later study, click the ADD button.

ADD checked items to Plant Press | check all | check none

Selections will appear in a new window.

open	save	hits	scientific	common	family	CNPS
		1	Amsinckia grandiflora	large-flowered fiddleneck	Boraginaceae	List 1B.1
		1	Amsinckia lunaris	bent-flowered fiddleneck	Boraginaceae	List 1B.2
		1	Anomobryum julaceum	slender silver moss	Bryaceae	List 2.2
		1	Arctostaphylos auriculata	Mt. Diablo manzanita	Ericaceae	List 1B.3
		1	Arctostaphylos manzanita ssp. laevigata	Contra Costa manzanita	Ericaceae	List 1B.2
		1	Astragalus tener var. tener	alkali milk-vetch	Fabaceae	List 1B.2
		1	Atriplex cordulata	heartscale	Chenopodiaceae	List 1B.2
		1	Atriplex depressa	brittlescale	Chenopodiaceae	List 1B.2
		1	Atriplex joaquiniana	San Joaquin spearscale	Chenopodiaceae	List 1B.2
		1	Atriplex persistens	vernal pool smallscale	Chenopodiaceae	List 1B.2
		1	Blepharizonia plumosa	big tarplant	Asteraceae	List 1B.1
		1	California macrophylla	round-leaved filaree	Geraniaceae	List 1B.1
		1	Calochortus pulchellus	Mt. Diablo fairy-lantern	Liliaceae	List 1B.2
		1	Calystegia atriplicifolia ssp. buttensis	Butte County morning-glory	Convolvulaceae	List 1B.2
		1	Campanula exigua	chaparral harebell	Campanulaceae	List

						1B.2
		1	**Centromadia parryi ssp. congdonii**	Congdon's tarplant	Asteraceae	List 1B.2
		1	**Centromadia parryi ssp. parryi**	pappose tarplant	Asteraceae	List 1B.2
		1	**Cicuta maculata var. bolanderi**	Bolander's water-hemlock	Apiaceae	List 2.1
		1	**Cirsium hydrophilum var. hydrophilum**	Suisun thistle	Asteraceae	List 1B.1
		1	**Cordylanthus mollis ssp. hispidus**	hispid bird's-beak	Scrophulariaceae	List 1B.1
		1	**Cordylanthus mollis ssp. mollis**	soft bird's-beak	Scrophulariaceae	List 1B.2
		1	**Cordylanthus nidularius**	Mt. Diablo bird's-beak	Scrophulariaceae	List 1B.1
		1	**Cryptantha hooveri**	Hoover's cryptantha	Boraginaceae	List 1A
		1	**Delphinium californicum ssp. interius**	Hospital Canyon larkspur	Ranunculaceae	List 1B.2
		1	**Didymodon norrisii**	Norris' beard moss	Pottiaceae	List 2.2
		1	**Downingia pusilla**	dwarf downingia	Campanulaceae	List 2.2
		1	**Eriastrum brandegeeae**	Brandegee's eriastrum	Polemoniaceae	List 1B.2
		1	**Eriogonum truncatum**	Mt. Diablo buckwheat	Polygonaceae	List 1B.1
		1	**Erysimum capitatum var. angustatum**	Contra Costa wallflower	Brassicaceae	List 1B.1
		1	**Eschscholzia rhombipetala**	diamond-petaled California poppy	Papaveraceae	List 1B.1
		1	**Fritillaria liliacea**	fragrant fritillary	Liliaceae	List 1B.2
		1	**Helianthella castanea**	Diablo helianthella	Asteraceae	List 1B.2
		1	**Hesperolinon breweri**	Brewer's western flax	Linaceae	List 1B.2
		1	**Isocoma arguta**	Carquinez goldenbush	Asteraceae	List 1B.1
		1	**Lasthenia conjugens**	Contra Costa goldfields	Asteraceae	List 1B.1
		1	**Lathyrus jepsonii var. jepsonii**	Delta tule pea	Fabaceae	List 1B.2
		1	**Legenere limosa**	legenere	Campanulaceae	List 1B.1
		1	**Lessingia hololeuca**	woolly-headed lessingia	Asteraceae	List 3
		1	**Lilaeopsis masonii**	Mason's lilaeopsis	Apiaceae	List 1B.1
		1	**Limosella subulata**	Delta mudwort	Scrophulariaceae	List

						2.1
		1	**Madia radiata**	showy golden madia	Asteraceae	List 1B.1
		1	**Malacothamnus hallii**	Hall's bush-mallow	Malvaceae	List 1B.2
		1	**Micropus amphibolus**	Mt. Diablo cottonweed	Asteraceae	List 3.2
		1	**Monardella villosa ssp. globosa**	robust monardella	Lamiaceae	List 1B.2
		1	**Navarretia gowenii**	Lime Ridge navarretia	Polemoniaceae	List 1B.1
		1	**Neostapfia colusana**	Colusa grass	Poaceae	List 1B.1
		1	**Oenothera deltoides ssp. howellii**	Antioch Dunes evening-primrose	Onagraceae	List 1B.1
		1	**Phacelia phacelioides**	Mt. Diablo phacelia	Hydrophyllaceae	List 1B.2
		1	**Plagiobothrys hystriculus**	bearded popcorn-flower	Boraginaceae	List 1B.1
		1	**Potamogeton filiformis**	slender-leaved pondweed	Potamogetonaceae	List 2.2

To save selected records for later study, click the ADD button.

ADD checked items to Plant Press check all check none

Selections will appear in a new window.

For more results click below:

APPENDIX G-2: SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING IN THE PLAN AREA FOR THE CITY OF PITTSBURG BART MASTER PLAN

TABLE F2-1 PLANT SPECIES FROM THE DATABASE SEARCHES

Scientific Name Common Name	Status			Habitat Description[4]	Considered in Impact Analysis	Rationale
	Federal[1]	State[2]	CNPS[3]			
Amsinckia grandiflora Large-flowered fiddleneck	FE	SE	1B.1	Annual herb in the borage family (Boraginaceae). Cismontane woodland, Valley and foothill grassland. Known fewer than five natural occurrences. Blooms: April – May Elevation: 275 – 550 meters	No	Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. There is one previously recorded occurrence within a five-mile radius of the Plan Area and two additional occurrences within a ten-mile radius of the Plan Area.
Amsinckia lunaris Bent-flowered fiddleneck	~	~	1B.2	Annual herb in the borage family (Boraginaceae). Coastal bluff scrub, cismontane woodland, Valley and foothill grassland. Blooms: March – June Elevation: 3 – 500 meters	No	Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. There are no previously recorded occurrences within a ten-mile radius of the Plan Area.
Anomobryum julaceum Slender silver moss	~	~	2.2	Moss in the family (Bryaceae). Broad-leafed upland forest, lower montane coniferous forest, North Coast coniferous forest in damp rock and soil on outcrops, usually on roadcuts. Infrequent in CA but abundant in much of its range. Elevation: 100 – 1,000 meters	No	Suitable habitat is not present within the Plan Area. There is one previously recorded occurrence within a five-mile radius of the Plan Area.
Arctostaphylos auriculata Mt. Diablo manzanita	~	~	1B.3	Perennial evergreen shrub in the heath family (Ericaceae). Chaparral (sandstone), cismontane woodland. Known from fewer than twenty occurrences. Blooms: January – March Elevation: 135 – 650 meters	No	Suitable habitat is not present within the Plan Area. There are nine previously recorded occurrences within a ten-mile radius of the Plan Area.
Arctostaphylos manzanita ssp. *laevigata* Contra Costa manzanita	~	~	1B.2	Perennial evergreen shrub in the heath family (Ericaceae). Chaparral (rocky). Blooms: January – March (April) Elevation: 500 – 1,100 meters	No	Suitable habitat is not present within the Plan Area. There are three previously recorded occurrences within a ten-mile radius of the Plan Area.
Astragalus tener var.	~	~	1B.2	Annual herb in the pea family (Fabaceae).	No	Suitable habitat is not present within the Plan Area.

Scientific Name Common Name	Status			Habitat Description[4]	Considered in Impact Analysis	Rationale
	Federal [1]	State[2]	CNPS [3]			
tener Alkali milk-vetch				Playas, Valley and foothill grassland (adobe clay), and vernal pools (alkaline). Blooms: March - June Elevation: 1 - 60 meters		The annual grassland within the Plan Area is significantly disturbed and degraded. There is one previously recorded occurrence within a ten-mile radius of the Plan Area.
Atriplex cordulata Heartscale	~	~	1B.2	Annual herb in the goosefoot family (Chenopodiaceae). Chenopod scrub, meadows and seeps, Valley and foothill grassland (sandy) /saline or alkaline. Blooms: April – October Elevation: 1 – 375 meters	No	Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. There are no previously recorded occurrences within a ten-mile radius of the Plan Area.
Atriplex depressa Brittlescale	~	~	1B.2	Annual herb in the goosefoot family (Chenopodiaceae). Chenopod scrub, meadows and seeps, playas, Valley and foothill grassland, Vernal pools in alkaline, clay soils. Blooms: May – October Elevation: 1- 320 meters	No	Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. There is one previously recorded occurrence within a ten-mile radius of the Plan Area.
Atriplex joaquiniana San Joaquin spearscale	~	~	1B.2	Annual herb in the goosefoot family (Chenopodiaceae). Chenopod scrub, meadows and seeps, playas, Valley and foothill grassland in alkaline soils. Blooms: April – October Elevation: 1 – 835 meters		Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. There is one previously recorded occurrence within a five-mile radius of the Plan Area and one additional occurrence within a ten-mile radius of the Plan Area.
Atriplex persistens Vernal pool smallscale			1B.2	Annual herb in the goosefoot family (Chenopodiaceae). Vernal pools (alkaline). Blooms: June - October Elevation: 10 - 115 meters	No	Suitable habitat is not present within the Plan Area. The annual grasslands within the Plan Area do not contain vernal pools. There are no previously recorded occurrences within a ten-mile radius of the Plan Area.
Blepharizonia plumosa Big tarplant	~	~	1B.1	Annual herb in the sunflower family (Asteraceae). Valley and foothill grassland. Dry hills and plains in annual grassland. Clay to clay-loam soils; usually on slopes and often in burned areas.	No	Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. There are three previously recorded occurrences within a five-mile radius of the Plan Area and ten additional

Scientific Name Common Name	Status			Habitat Description[4]	Considered in Impact Analysis	Rationale
	Federal[1]	State[2]	CNPS[3]			
				Blooms: July - October Elevation: 30 - 505 meters		occurrences within a ten-mile radius of the Plan Area.
California macrophylla Round-leaved filaree	~	~	1B.1	Annual herb in the geranium family (Geraniaceae). Cismontane woodland, Valley and foothill grassland in clay soils. Blooms: March - May Elevation: 15 – 1,200 meters	**Yes**	There is potential that this species occurs on the project site. This species occurs in disturbed areas. There is one previously recorded occurrence within a five-mile radius of the Plan Area and five additional occurrences within a ten-mile radius of the Plan Area.
Calochortus pulchellus Mt. Diablo fairy-lantern	~	~	1B.2	Perennial bulbiferous herb in the lily family (Liliaceae). Chaparral, cismontane woodland, riparian woodland, Valley and foothill grassland. Blooms: April - June Elevation: 30 – 840 meters	No	Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. There are 18 previously recorded occurrences within a ten-mile radius of the Plan Area.
Calystegia Butte County morning-glory	~	~	1B.2	Perennial rhizomatous herb in Convolvulaceae. chaparral, lower montane coniferous forest /rocky, sometimes roadside. Blooms: May - July Elevation: 600 meters	No	Suitable habitat is not present within the Plan Area. There are no previously recorded occurrences within a ten-mile radius of the Plan Area.
Campanula exigua Chaparral harebell	~	~	1B.2	Annual herb in the bellflower family (Campanulaceae). Chaparral (rocky, usually serpentinite). Blooms: May – June Elevation: 275 – 1,250 meters	No	Suitable habitat is not present within the Plan Area. There are five previously recorded occurrences within a ten-mile radius of the Plan Area.
Centromadia parryi ssp. *congdonii* Congdon's tarplant	~	~	1B.2	Annual herb in the sunflower family (Asteraceae). Valley and foothill grassland (alkaline). Blooms: May – October (November) Elevation: 1 – 230 meters	**Yes**	Marginally suitable habitat is present within the Plan Area. There are four previously recorded occurrences within a ten-mile radius of the Plan Area.
Centromadia parryi ssp. *parryi* Pappose tarplant	~	~	1B.2	Annual herb in the sunflower family (Asteraceae). Chaparral, Coastal prairie, Meadows and seeps, Marshes and swamps (coastal salt), Valley and foothill grassland vernally mesic) /often alkaline.	No	Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. There are no previously recorded occurrences within a ten-mile radius of the Plan Area.

Scientific Name Common Name	Status			Habitat Description[4]	Considered in Impact Analysis	Rationale
	Federal [1]	State[2]	CNPS [3]			
				Blooms: May - November Elevation: 2 meters		
Cirsium hydrophilum var. *hydrophilum* Suisun thistle	FE	~	1B.2	Perennial herb in the sunflower family (Asteraceae). Marshes and swamps (salt). Known from two occurrences - Grizzly Island WA and Peytonia Slough ER (both DFG). Blooms: June – September Elevation: 0 – 1 meters	No	Suitable habitat is not present within the Plan Area. There are no previously recorded occurrences within a ten-mile radius of the Plan Area.
Cordylanthus mollis ssp. hispidus Hispid bird's-beak	~	~	1B.1	Hemi-parasitic annual herb in the figwort family (Scrophulariaceae). Meadows and seeps, playas, valley and foothill grassland in alkaline soils. Apparently extirpated from much of the lower San Joaquin Valley. Blooms: June – September Elevation: 1 – 155 meters	No	Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. There are no previously recorded occurrences within a ten-mile radius of the Plan Area.
Cordylanthus mollis ssp. mollis Soft bird's-beak	FE	CR	1B.2	Hemiparasitic annual herb in the Scrophulariaceae family. Marshes and swamps (coastal salt). Known from fewer than fifteen occurrences. Blooms: July - November Elevation: 0 meters	No	Suitable habitat is not present within the Plan Area. There are three previously recorded occurrences within a five-mile radius of the Plan Area and two additional occurrences within a ten-mile radius of the Plan Area.
Cordylanthus nidularius Mt. Diablo bird's-beak	~	SE	1B.1	Hemiparasitic annual herb in the Scrophulariaceae. Chaparral (serpentinite). Known from only one occurrence on Mt. Diablo. Blooms: July - August Elevation: 600 meters	No	Suitable habitat is not present within the Plan Area. There is one previously recorded occurrence within a ten-mile radius of the Plan Area.
Cryptantha hooveri Hoover's cryptantha	~	~	1A	Annual herb in the borage family (Boraginaceae). Inland dunes, Valley and foothill grassland (sandy). Last seen in 1939.	No	Suitable habitat is not present within the Plan Area. There is one previously recorded occurrence within a ten-mile radius of the Plan Area.

Scientific Name Common Name	Status			Habitat Description[4]	Considered in Impact Analysis	Rationale
	Federal[1]	State[2]	CNPS[3]			
				Blooms: April - May Elevation: 9 meters		
Delphinium californicum ssp. *interius* Hospital Canyon larkspur	~	~	1B.2	Perennial herb in the buttercup family (Ranunculaceae). Chaparral (openings), and cismontane woodland (mesic). Blooms: April - June Elevation: 230 – 1,095 meters	No	Suitable habitat is not present within the Plan Area. There are two previously recorded occurrences within a ten-mile radius of the Plan Area.
Didymodon norrisii Norris' beard moss	~	~	2.2	Moss in the Pottiaceae family. Cismontane woodland, Lower montane coniferous forest /intermittently mesic, rock. Elevation: 600 – 1,973 meters	No	Suitable habitat is not present within the Plan Area. There is one previously recorded occurrence within a ten-mile radius of the Plan Area.
Downingia pusilla Dwarf downingia	~	~	2.2	Annual herb in the Campanulaceae family. Valley and foothill grassland (mesic), Vernal pools. Blooms: March - May Elevation: 1 - 445meters	No	Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. There are two previously recorded occurrences within a ten-mile radius of the Plan Area.
Eriastrum brandageeae Brandagee's eriastrum	~	~	1B.2	Annual herb in the Polemoniaceae family. Chaparral, cismontane woodland/ volcanic, sandy. Blooms: April - August Elevation: 305 - 1,030 meters	No	Suitable habitat is not present within the Plan Area. There is one previously recorded occurrence within a ten-mile radius of the Plan Area.
Eriogonum truncatum Mt. Diablo buckwheat	~	~	1B.1	Annual herb in the knotweed family (Polygonaceae). Chaparral, coastal scrub, Valley and foothill grassland, sandy. Rediscovered in May 2005 in Mount Diablo State Park; now known from one extant occurrence. Blooms: April – September (November - December) Elevation: 3 – 350 meters	No	Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. There are three previously recorded occurrences within a ten-mile radius of the Plan Area.
Erysimum capitatum var. *angustatum* Contra Costa	FE	SE	1B.1	Perennial herb in the mustard family (Brassicaceae). Inland dunes. Known only from the Antioch Dunes.	No	Suitable habitat is not present within the Plan Area. There are three previously recorded occurrences within a ten-mile radius of the Plan Area.

Scientific Name Common Name	Status			Habitat Description[4]	Considered in Impact Analysis	Rationale
	Federal[1]	State[2]	CNPS[3]			
wallflower				Blooms: March - July Elevation: 3 - 20 meters		
Eschscholzia rhombipetala Diamond-petaled California poppy	~	~	1B.1	Annual herb in the poppy family (Papaveraceae). Valley and foothill grassland (alkaline, clay). Found at Lawrence Livermore Laboratory, Alameda Co. Blooms: March – April Elevation: 0 – 975 meters	No	Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. There is one previously recorded occurrence within a ten-mile radius of the Plan Area.
Fritillaria liliacea Fragrant fritillary	~	~	1B.2	Perennial bulbiferous herb in the lily family (Liliaceae). Cismontane woodland, coastal prairie, coastal scrub, Valley and foothill grassland (often serpentinite). Quite variable. Blooms: February - April Elevation: 3 – 410 meters	No	Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. There are two previously recorded occurrences within a ten-mile radius of the Plan Area.
Helianthella castanea Diablo helianthella	~	~	1B.2	Perennial herb in the sunflower famiy (Asteraceae). Broad-leafed upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, Valley and foothill grassland. Blooms: March – June Elevation: 60 – 1,300 meters	No	Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. There are 18 previously recorded occurrences within a ten-mile radius of the Plan Area.
Hesperolinon breweri Brewer's western flax	~	~	1B.2	Aannual herb in the flax family (Linaceae). Chaparral, cismontane woodland, Valley and foothill grassland (usually serpentinite). Blooms: May – July Elevation: 30 – 900 meters	No	Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. There are seven previously recorded occurrences within a ten-mile radius of the Plan Area.
Isocoma arguta Carquinez goldenbush	~	~	1B.1	Perennial shrub in the sunflower family (Asteraceae). Valley and foothill grassland (alkaline). Blooms: August - December	No	Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. There are two previously recorded occurrences within a ten-mile radius of the Plan Area.

Scientific Name Common Name	Status			Habitat Description[4]	Considered in Impact Analysis	Rationale
	Federal [1]	State[2]	CNPS [3]			
				Elevation: 1 - 20meters		
Lasthenia conjugens Contra Costa goldfields	FE	~	1B.1	Annual herb in the sunflower family (Asteraceae). Cismontane woodland, playas (alkaline), Valley and foothill grassland, vernal pools (mesic). Many historical occurrences extirpated. Blooms: March - June Elevation: 0 – 470 meters	No	Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. There is one previously recorded occurrence within a five-mile radius of the Plan Area and two additional occurrences within a ten-mile radius of the Plan Area.
Lathyrus jepsonii var. *jepsonii* Delta tule pea	~	~	1B.2	Perennial herb in the pea family (Fabaceae). Marshes and swamps (freshwater and brackish). Blooms: May – July (September) Elevation: 0 – 4 meters	No	Suitable habitat is not present within the Plan Area. The wetland within Plan Area is degraded and surrounded on all side by developed or disturbed habitats. It is unlikely that this species occurs within the Plan Area. There are 13 previously recorded occurrences within a five-mile radius of the Plan Area and 25 additional occurrences within a ten-mile radius of the Plan Area.
Legenere limosa Legenere	~	~	1B.1	Annual herb in the bellflower family (Campanulaceae). Vernal pools. Many historical occurrences extirpated. Blooms: April - June Elevation: 1 - 880 meters	No	Suitable habitat is not present within the Plan Area. There are no previously recorded occurrences within a ten-mile radius of the Plan Area.
Lilaeopsis masonii Mason's lilaeopsis	~	CR	1B.1	Perennial rhizomatous herb in the carrot family (Apiaceae). Marshes and swamps (brackish or freshwater), Riparian scrub. Locally common in Suisun Bay. Blooms: April - November Elevation: 0 - 10meters		Suitable habitat is not present within the Plan Area. There are 13 previously recorded occurrences within a five-mile radius of the Plan Area and 32 additional occurrences within a ten-mile radius of the Plan Area.
Limosella subulata Delta mudwort	~	~	2.1	Perennial stoloniferous herb in the Scrophulariaceae. Marshes and swamps. Known in CA from several occurrences in the Delta. Blooms: May - August Elevation: 0 - 3 meters	No	Suitable habitat is not present within the Plan Area. There is one previously recorded occurrence within a five-mile radius of the Plan Area and five additional occurrences within a ten-mile radius of the Plan Area.
Madia radiata Showy golden madia			1B.1	Annual herb in the sunflower family (Asteraceae). Cismontane woodland,	No	Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is

Scientific Name Common Name	Status			Habitat Description[4]	Considered in Impact Analysis	Rationale
	Federal [1]	State[2]	CNPS [3]			
				Valley and foothill grassland. Occurrences scattered. Blooms: March – May Elevation: 25 – 900 meters		significantly disturbed and degraded. There is one previously recorded occurrence within a five-mile radius of the Plan Area and two additional occurrences within a ten-mile radius of the Plan Area.
Malacothamnus hallii Hall's bush-mallow	~	~	1B.2	Perennial evergreen shrub in the mallow family (Malvaceae). Chaparral and coastal scrub. Mendocino Co. occurrence needs verification. A synonym of *M. fasciculatus* in The Jepson Manual. Blooms: May – September (October) Elevation: 10 – 760 meters	No	Suitable habitat is not present within the Plan Area. There are five previously recorded occurrences within a ten-mile radius of the Plan Area.
Monardella villosa ssp. *globosa* Robust monardella	~	~	1B.2	Perennial rhizomatous herb in the mint family (Lamiaceae). Broad-leafed upland forest (openings), chaparral (openings), cismontane woodland, coastal scrub, Valley and foothill grassland. Blooms: June – July (August) Elevation: 100 – 915 meters	No	Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. There is one previously recorded occurrence within a ten-mile radius of the Plan Area.
Navarretia gowenii Lime Ridge navarretia	~	~	1B.1	Annual herb in the Polemoniaceae. Chaparral. Known from only four occurrences. Blooms: May - June Elevation: 180 - 305meters	No	Suitable habitat is not present within the Plan Area. There are two previously recorded occurrences within a ten-mile radius of the Plan Area.
Oenothera deltoids ssp. howelli Antioch Dunes evening-primrose	FE	SE	1B.1	Perennial herb in the Onagraceae. Inland dunes. Known from three native occurrences. Blooms: March - September Elevation: 0 – 30 meters	No	Suitable habitat is not present within the Plan Area. There are two previously recorded occurrences within a five-mile radius of the Plan Area and four additional occurrences within a ten-mile radius of the Plan Area.
Phacelia phacelioides Mt. Diablo phacelia			1B.2	Annual herb in the waterleaf family (Hydrophyllaceae). Chaparral, cismontane woodland (rocky). Known from fewer than twenty occurrences. Many occurrences historical; need field surveys.	No	Suitable habitat is not present within the Plan Area. There are six previously recorded occurrences within a ten-mile radius of the Plan Area.

Scientific Name Common Name	Status			Habitat Description[4]	Considered in Impact Analysis	Rationale
	Federal [1]	State[2]	CNPS [3]			
				Blooms: April – May Elevation: 500 – 1,370 meters		
Plagiobothrys Bearded popcorn-flower	~	~	1B.1	Annual herb in the borage family (Boraginaceae). Valley and foothill grassland (mesic), Vernal pools margins /often vernal swales. Blooms: April - May Elevation: 0 - 274 meters	No	Suitable habitat is not present within the Plan Area. Vernal pools do not occur within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. This species is unlikely to occur within the Plan Area.
Potamogeton filiformis Slender-leaved pondweed	~	~	2.2	An aquatic rhizomatous herb in the pondweed family (Potamogetonaceae). Marshes and swamps. To be expected in the San Joaquin Valley, San Francisco Bay area, and the central high Sierra Nevada; need information. Blooms: May – July Elevation: 300 – 2,150 meters	No	Suitable habitat is not present within the Plan Area. There is one previously recorded occurrence within a one-mile radius of the Plan Area.
Sanicula saxatilis Rock sanicle	~	CR	1B.2	Perennial herb in the carrot family (Apiaceae). Broad-leafed upland forest, chaparral, Valley and foothill grassland (rocky). Known from fewer than fifteen occurrences. Blooms: April – May Elevation: 620 – 1,175 meters	No	Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. There are five previously recorded occurrences within a ten-mile radius of the Plan Area.
Senecio aphanactis Chaparral ragwort	~	~	2.2	Annual herb in the sunflower family (Asteraceae). Chaparral, cismontane woodland, coastal scrub, sometimes alkaline. Blooms: January – April Elevation: 15 – 800 meters	No	Suitable habitat is not present within the Plan Area. There is one previously recorded occurrence within a five-mile radius of the Plan Area.
Streptanthus albidus ssp. *peramoenus* Most beautiful jewel-flower	~	~	1B.2	Annual herb in the mustard family (Brassicaceae). Chaparral, cismontane woodland, Valley and foothill grassland, serpentinite. Blooms: (March) April – September	No	Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. There are four previously recorded occurrences within a ten-mile radius of the Plan Area.

Scientific Name **Common Name**	**Status**			**Habitat Description[4]**	**Considered in Impact Analysis**	**Rationale**
	Federal[1]	**State[2]**	**CNPS[3]**			
				(October) Elevation: 94 – 1,000 meters		
Streptanthus hispidus Mt. Diablo jewel-flower	~	~	1B.3	Annual herb in the mustard family (Brassicaceae). Chaparral, Valley and foothill grassland, rocky. Known from fewer than fifteen occurrences in the Mt. Diablo area. Blooms: March – June Elevation: 365 – 1,200 meters	No	Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. There are ten previously recorded occurrences within a ten-mile radius of the Plan Area.
Symphyotrichum lentum Suisun Marsh aster	~	~	1B.2	Perennial rhizomatous herb in the sunflower family (Asteraceae). Marshes and swamps (brackish and freshwater). Blooms: May – November Elevation: 0 – 3 meters	No	Suitable habitat is not present within the Plan Area. There are eight previously recorded occurrences within a five-mile radius of the Plan Area and 29 additional occurrences within a ten-mile radius of the Plan Area.
Triquetrella californica Coastal triquetrella	~	~	1B.2	Moss in the Pottiaceae family. Coastal bluff scrub, coastal scrub (soil). Known in CA from fewer than ten small coastal occurrences. Elevation: 10 – 100 meters	No	Suitable habitat is not present within the Plan Area. There is one previously recorded occurrence within a ten-mile radius of the Plan Area.
Tropidocarpum capparideum Caper-fruited tropidocarpum	~	~	1B.1	Annual herb in the mustard family (Brassicaceae). Valley and foothill grassland (alkaline hills). Blooms: March - April Elevation: 1 – 455 meters	No	Suitable habitat is not present within the Plan Area. The annual grassland within the Plan Area is significantly disturbed and degraded. There is one previously recorded occurrence within a five-mile radius of the Plan Area.
Viburnum ellipticum Oval-leaved viburnum	~	~	2.3	Perennial deciduous shrub in the honeysuckle family (Caprifoliaceae). Chaparral, cismontane woodland, and lower montane coniferous forest. Blooms: May – June Elevation: 215 – 1,400 meters	No	Suitable habitat is not present within the Plan Area. There are two previously recorded occurrences within a ten-mile radius of the Plan Area.

CODE DESIGNATIONS

Federal status[1]	State status[2]	CNPS[3]
FE = Listed as endangered under the Federal Endangered Species Act	**SE** = Listed as endangered under the California Endangered Species Act	**1A** = Plants species that presumed extinct in California.
FT = Listed as threatened under the Federal Endangered Species Act	**ST** = Listed as threatened under the California Endangered Species Act	**1B** = Plant species that are rare, threatened, or endangered in California and elsewhere.
	CR = Species identified as rare by CDFG	**2** = Plant species that are rare, threatened, or endangered in California, but more common elsewhere.
		Threat Ranks **0.1**-Seriously threatened in California (high degree/immediacy of threat) **0.2**-Fairly threatened in California (moderate degree/immediacy of threat) **0.3**-Not very threatened in California (low degree/immediacy of threats or no current threats known)
Habitat description[4]: Habitat description adapted from CNDDB (CDFG 2009) and CNPS online inventory (CNPS 2009) ; Note: Listed Blooming period months in parenthesis indicate uncommon blooming period (e.g., June-July (August)).		

References

California Native Plant Society (CNPS). 2009. Inventory of Rare and Endangered Plants (online edition, v7-08d). California Native Plant Society. Sacramento, CA. Accessed on April 27, 2009 from http://www.cnps.org/inventory

TABLE B-2: WILDLIFE SPECIES

Scientific Name Common Name	Status Federal[1]	State[2]	Habitat Description[3]	Considered in Impact Analysis	Rationale
Invertebrates					
Apodemia mormo langei Lange's metalmark butterfly	FE	~	Inhabits stabilized dunes along the San Joaquin River. Endemic to Antioch Dunes, Contra Costa County. The primary host plant is naked buckwheat (*Eriogonum nudum* var. *auriculatum*). It feeds on nectar of other flowers as well as host plant.	No	Suitable habitat is not located within the Plan Area. The host plant for this species was also not observed during the 2009 surveys. There is one previously recorded occurrence within a five-mile radius of the Plan Area.
Branchinecta conservatio Conservancy fairy shrimp	FE	~	Inhabits rather large, cool-water vernal pools with moderately turbid water. They have been collected from early November to early April. Currently, the USFWS is aware of eight populations of Conservancy fairy shrimp, which include (from north to south): (1) Vina Plains, Butte and Tehama counties; (2) Sacramento National Wildlife Refuge, Glenn County; (3) Yolo Bypass Wildlife Area, Yolo County; (4) Jepson Prairie, Solano County; (5) Mapes Ranch, Stanislaus County; (6) University of California, Merced, Merced County; (7) Grasslands Ecological Area, Merced County and (8) Los Padres National Forest, Ventura County.	No	Suitable habitat is not present within the Plan Area. There are four previously recorded occurrences within a ten-mile radius of the Plan Area.
Branchinecta longiantenna Longhorn fairy shrimp	FE	~	A freshwater fairy shrimp. It inhabits the ephemeral water of swales and vernal pools. It has been found in grass-bottomed pools in unplowed grasslands as well as clear-water pools in sandstone depressions. Known to occur in clear, moderately deep, small to medium size pool depressions in bedrock outcrops; moderately deep,	No	Suitable habitat is not present within the Plan Area. There are no previously recorded occurrences within a ten-mile radius of the Plan Area.

Scientific Name Common Name	Status Federal[1]	State[2]	Habitat Description[3]	Considered in Impact Analysis	Rationale
			medium to large sized turbid alkali pools in the Kesterson National Wildlife Refuge in western Merced County.		
Branchinecta lynchi Vernal pool fairy shrimp	FT	~	Inhabits vernal pools containing clear to highly turbid water, ranging in size from 54 square feet in the former Mather Air Force Base area of Sacramento County, to the 89-acre Olcott Lake at Jepson Prairie. Tadpole shrimp climb objects and plow along or within bottom sediments feeding on organic debris and living organisms, such as fairy shrimp and other invertebrates.	No	Suitable habitat is not present within the Plan Area. There are no previously recorded occurrences within a ten-mile radius of the Plan Area.
Callophrys [Incisalia] mossii bayensis San Bruno elfin butterfly	FE	~	This species inhabits rocky outcrops and cliffs in coastal scrub on the San Francisco peninsula. Its patchy distribution reflects that of its host plant, stonecrop (*Sedum spathulifolium*). San Bruno Mountain, in San Mateo County; also, Milagra Ridge, Montara Mountain, Whiting Ridge.	No	Suitable habitat is not present within the Plan Area. The host plant was not observed within the Plan Area. There is one previously recorded occurrence within a ten-mile radius of the Plan Area.
Desmocerus californicus dimorphus Valley elderberry longhorn beetle (VELB)	FT; FPD	~	Associated exclusively with elderberry shrubs (*Sambucus sp.*) in Central Valley and foothills during its entire life cycle; larvae bore into elderberry stems and feed upon the pith during their two-year life cycle.	No	Suitable habitat is not present within the Plan Area. The host plant was not observed within the Plan Area. There are no previously recorded occurrences within a ten-mile radius of the Plan Area. The Plan Area is outside this species' range.
Lepidurus packardi Vernal pool tadpole shrimp	FE	~	Inhabits vernal pools containing clear to highly turbid water, ranging in size from 54 square feet in the former Mather Air Force Base area of Sacramento County, to the 89-acre Olcott Lake at Jepson Prairie. Tadpole shrimp climb objects and plow along or	No	Suitable habitat is not present within the Plan Area. There are two previously recorded occurrences within a ten-mile radius of the Plan Area.

Scientific Name Common Name	Status Federal[1]	State[2]	Habitat Description[3]	Considered in Impact Analysis	Rationale
			within bottom sediments feeding on organic debris and living organisms, such as fairy shrimp and other invertebrates. Superficially resembles the ricefield tadpole shrimp (*Triops longicaudatus*).		
Speyeria callippe callippe Callippe silverspot butterfly	FE	~	Restricted to northern coastal scrub of the San Francisco peninsula. Host plant is *Viola pedunculata*. Most adults found on east-facing slopes; males congregate on hilltops in search of females.	No	Suitable habitat is not present within the Plan Area. There are no previously recorded occurrences within a ten-mile radius of the Plan Area.
Syncaris pacifica California freshwater shrimp	FE	~	Endemic to Marin, Napa, and Sonoma Counties. Found in low elevation, low gradient streams where riparian cover is moderate to heavy. Prefers shallow pools away from main stream-flow. Winter: undercut banks with exposed roots. Summer: leafy branches touching water.	No	Suitable habitat is not present within the Plan Area. There are no previously recorded occurrences within a ten-mile radius of the Plan Area.
Fish					
Acipenser medirostris Green sturgeon	FT	~	The green sturgeon is a widely distributed, ocean-oriented sturgeon found in nearshore marine waters from Baja Mexico to Canada. Green sturgeon are anadromous, spawning in the Sacramento, Klamath and Rogue rivers in the spring. Individuals spawn every few years beginning about age 15. Green sturgeon congregate in these and other estuaries during the summer, where they appear to neither breed nor feed. Neither the purpose of these aggregations nor the portion of the population participating in them is known.	No	Suitable habitat is not present within the Plan Area. There are no drainages or other waterways within or surrounding the Plan Area where this species may occur or be negatively impacted by the proposed project.
Hypomesus transpacificus	FT	ST	Located exclusively in the Sacramento-San Joaquin Delta. They have been found as far upstream as the mouth of the American	No	Although there are two previously recorded occurrences within a ten-mile

Scientific Name Common Name	Status Federal[1]	State[2]	Habitat Description[3]	Considered in Impact Analysis	Rationale
Delta smelt			River on the Sacramento River and Mossdale on the San Joaquin River. They extend downstream as far as San Pablo Bay. Delta smelt are found in brackish water. They usually inhabit salinity ranges of less than two parts per thousand (ppt) and are rarely found at salinities greater than 14 ppt.		radius of the Plan Area, suitable habitat is not present within the Plan Area. There are no drainages or other waterways within or surrounding the Plan Area where this species may occur or be negatively impacted by the proposed project.
Lampetra ayresi River lamprey	~	CSC	River lampreys are anadromous and they live a predaceous life when in the ocean. Larval lampreys burrow themselves tail-first into the soft substrate of a backwater where they feed on drifting matter such as algae and microorganisms. Before river lampreys have completed metamorphosis into adults, they assemble at the mouth of the river, finally entering the ocean in late spring. River lampreys are believed to spend only 3-4 months at sea where they grow rapidly by attaching to fish such as salmon and herring and feeding on muscle tissue. In the fall of the same year the river lampreys return to their natal streams and spawn from February to May.	No	Suitable habitat is not present within the Plan Area. There are no drainages or other waterways within or surrounding the Plan Area where this species may occur or be negatively impacted by the proposed project.
Oncorhynchus kisutch Coho salmon central California coast	FE	SE	Anadromous fish. Naturally occurring in the Pacific Ocean and tributary drainages from the Anadyr River south to northern Japan and from Point Hope, Alaska, south to California (California: Klamath, Trinity, Mad, Noyo, and Eel rivers, with smaller populations south to the San Lorenzo River in Santa Cruz County) and infrequently as far south as Chamalu Bay, Baja California;	No	Suitable habitat is not present within the Plan Area. There are no drainages or other waterways within or surrounding the Plan Area where this species may occur or be negatively impacted by the proposed project.

Scientific Name Common Name	Status Federal[1]	State[2]	Habitat Description[3]	Considered in Impact Analysis	Rationale
			most abundant between Oregon and southeastern Alaska, rare south of central California.		
Oncorhynchus mykiss irideus Steelhead central California coast ESU	FT	~	Both anadromous and non-anadromous forms exist. Anadromous forms migrate between freshwater breeding and marine non-breeding habitats; California breeders migrate to non-breeding habitats as far away as Alaska. This species inhabits the Sacramento and San Joaquin rivers and their tributaries; now extirpated from most of historical range.	No	Suitable habitat is not present within the Plan Area. There are no drainages or other waterways within or surrounding the Plan Area where this species may occur or be negatively impacted by the proposed project.
Oncorhynchus tshawytscha Central Valley Chinook salmon Spring-run ESU	FT	ST	Existing populations spawn in the Sacramento River and its tributaries in California. Historically, this ESU was the dominant run in the Sacramento and San Joaquin river basins, but native populations in the San Joaquin River apparently all have been extirpated.	No	Suitable habitat is not present within the Plan Area. There are no drainages or other waterways within or surrounding the Plan Area where this species may occur or be negatively impacted by the proposed project.
Oncorhynchus tshawytscha Central Valley Chinook salmon Winter-run ESU	FE	SE	Spawns primarily in the mainstem of the Sacramento River immediately downstream of Keswick Dam and below the historic spawning grounds downstream from Shasta Reservoir; most suitable spawning areas are between the Red Bluff Diversion Dam and Keswick Dam. Migrates through the Sacramento River, Delta, and San Pablo and San Francisco bays to nonbreeding habitat in the Pacific Ocean. Some juveniles rear non-natally for brief periods in lower reaches of tributaries.	No	Suitable habitat is not present within the Plan Area. There are no drainages or other waterways within or surrounding the Plan Area where this species may occur or be negatively impacted by the proposed project.
Pogonichthys	~	CSC	Sacramento-San Joaquin rivers, their sluggish tributaries and sloughs, and the	No	Although there are three previously recorded

Scientific Name Common Name	Status Federal[1]	State[2]	Habitat Description[3]	Considered in Impact Analysis	Rationale
macrolepidotus Sacramento splittail			Delta estuary. Requires flooded vegetation for spawning and juvenile foraging habitat. Native to rivers, sloughs, and lakes in the Sacramento and San Joaquin valleys, California; north to Redding, up the Feather River as far as Oroville, and in the American River to Folsom. During most years, except when spawning, splittails are largely confined to the Delta, Suisun Bay, Suisun Marsh, the lower Napa River, the lower Petaluma River, and other parts of the Sacramento-San Joaquin estuary, except in very wet years when the range may extend farther upstream in the Sacramento and San Joaquin river drainages.		occurrences within a ten-mile radius of the Plan Area, suitable habitat is not present within the Plan Area. There are no drainages or other waterways within or surrounding the Plan Area where this species may occur or be negatively impacted by the proposed project.
Spirinchus thaleichthys Longfin smelt	~	ST	Their primary habitat is the open water of estuaries, where they can be found in both the seawater and freshwater areas, typically in the middle or deeper parts of the water column. Longfin smelt are pelagic, estuarine fish which range from Monterey Bay northward to Hinchinbrook Island, Prince William Sound Alaska. In California, they have been commonly collected from San Francisco Bay, Eel River, Humboldt Bay and Klamath River. Presently, the only California collections made in the 1990s have been from the Klamath River and San Francisco Bay.	No	Suitable habitat is not present within the Plan Area. There are no drainages or other waterways within or surrounding the Plan Area where this species may occur or be negatively impacted by the proposed project.
Amphibians					
Ambystoma californiense California tiger salamander	FT	CSC	Typically found in annual grasslands of lower hills and valleys; breeds in temporary and permanent ponds and in streams; uses rodent burrows and other subterranean	No	There are 21 previously recorded occurrences within a five-mile radius of the Plan Area and 20 additional

Scientific Name Common Name	Status Federal[1]	State[2]	Habitat Description[3]	Considered in Impact Analysis	Rationale
			retreats in surrounding uplands for shelter; appears to be absent in waters containing predatory game fish. The California tiger salamander spends most of its lifecycle estivating underground in adjacent valley oak woodland or grassland habitat, primarily in abandoned rodent burrows. Research has shown that dispersing juveniles can roam up to two miles from their breeding ponds and that a minimum of several hundred acres of uplands habitat is needed surrounding a breeding pond in order for the species to survive over the long term.		occurrences within a ten-mile radius of the Plan Area. The freshwater emergent wetland within the Plan Area is surrounded by urban development. It is not connected to other waterways except by underground stormwater drains. It is choked with cattails (*Typha* spp.) and therefore would not be suitable habitat for this species.
Rana aurora draytonii California red-legged frog	FT	CSC	Found in humid forests, woodlands, grasslands, and streamsides with plant cover. Most common in lowlands or foothills. Frequently found in woods adjacent to streams. Breeding habitat is in permanent or late season sources of deep water; lakes, ponds, reservoirs, slow streams, marshes, bogs, and swamps. From sea level to 8,000 feet (2,440 meters). Breeds late December to early April. Endemic to California and northern Baja California. Ranges along the coast from Mendocino County in northern California south to northern Baja California, and inland through the northern Sacramento Valley into the foothills of the Sierra Nevada mountains, south to Tulare county, and possibly Kern county.	No	There are nine previously recorded occurrences within a five-mile radius of the Plan Area and 13 additional occurrences within a ten-mile radius of the Plan Area. Suitable habitat is not present within the Plan Area. The freshwater emergent wetland within the Plan Area is surrounded by urban development. It is not connected to other waterways except by underground stormwater drains. It is choked with cattails and therefore would not be suitable habitat for this species.
Reptiles					

Scientific Name Common Name	Status Federal[1]	State[2]	Habitat Description[3]	Considered in Impact Analysis	Rationale
Actinemys marmorata Western pond turtle	~	CSC	Permanent or nearly permanent water in various habitats (e.g. ponds, streams, perennial drainages). Requires basking sites particularly in areas vegetated with riparian habitats. The western pond turtle includes two subspecies, the northwestern pond turtle (*A. m. marmorata)* and the southwestern pond turtle (*A. m. pallida*). The two subspecies range is interconnected within and around the San Francisco Bay Area.	No	There is one previously recorded occurrence within a five-mile radius of the Plan Area and four additional occurrences within a ten-mile radius of the Plan Area. Suitable habitat is not present within the Plan Area. The freshwater emergent wetland within the Plan Area is surrounded by urban development. It is not connected to other waterways except by underground stormwater drains. It is choked with cattails and does not contain suitable basking sites for this species.
Anniella pulchra pulchra Silvery legless lizard	~	CSC	This species inhabits riparian, sand/dune, shrubland/chaparral, woodland-hardwood, and mixed woodland. Burrows in loose soil, especially in semi-stabilized sand dunes and also in other areas with sandy soil, in areas vegetated with oak or pine-oak woodland, or chaparral; also wooded stream edges, and occasionally desert-scrub. Bush lupine often is an indicator of suitable conditions. Often found in leaf litter, under rocks, logs, and driftwood. May forage in leaf litter during the day, emerging on the surface at dusk or at night.	No	Suitable habitat is not present within the Plan Area. There are five previously recorded occurrences within a ten-mile radius of the Plan Area.
Masticophis lateralis euryxanthus	FT	ST	A slim-bodied snake. This species inhabits chaparral foothills, shrublands with	No	Suitable habitat is not present within the Plan Area. There

Scientific Name Common Name	Status Federal[1]	State[2]	Habitat Description[3]	Considered in Impact Analysis	Rationale
Alameda whipsnake			scattered grassy patches, rocky canyons and watercourses, and adjacent habitats. Underground or under cover when inactive. Lays eggs probably most often in abandoned rodent burrows, perhaps also in other protected sites underground or under imbedded objects. Small range in hills in the eastern San Francisco Bay area, California.		are 21 previously recorded occurrence within a five-mile radius of the Plan Area and 18 additional occurrences within a ten-mile radius of the Plan Area.
Phrynosoma coronatum frontale California horned lizard	~	CSC	Frequents a wide variety of habitats; most common in lowlands along sandy washes with scattered low bushes. This species inhabits open areas of sandy soil and low vegetation in valleys, foothills and semiarid mountains from sea level to 8,000 ft. (2,438 m) in elevation. Found in grasslands, coniferous forests, woodlands, and chaparral, with open areas and patches of loose soil. Often found in lowlands along sandy washes with scattered shrubs and along dirt roads, and frequently found near anthills. Historically, found along the Pacific coast from the Baja California border west of the deserts and the Sierra Nevada, north to the Bay Area, and inland as far north as Shasta Reservoir, and south into Baja California. Current range is more fragmented.	No	Suitable habitat is not present within the Plan Area. There are two previously recorded occurrences within a ten-mile radius of the Plan Area.
Thamnophis gigas Giant garter snake	FT	ST	Inhabits freshwater sloughs, marshes, canals, wetlands. Also uses rice fields, drainage canals and irrigation ditches for hunting and overwinters underground in uplands. This species inhabits small mammal burrows and other soil crevices above prevailing flood elevations throughout its	No	Suitable habitat is not present within the Plan Area. There are no previously recorded occurrences within a ten-mile radius of the Plan Area.

Scientific Name Common Name	Status Federal[1]	State[2]	Habitat Description[3]	Considered in Impact Analysis	Rationale
			winter dormancy period. Burrows commonly have sunny exposure along south and west facing slopes. The breeding season extends through March and April, and females give birth to live young from late July through early September.		
Birds					
			CHARADRIIFORMES (shorebirds, gulls)		
Charadrius montanus Mountain plover	MNBMC	CSC	Non-breeding habitat in California. Preferred habitat consists of short-grass plains and fields, plowed fields and sandy deserts, and commercial sod farms. In southern California, wintering birds preferred heavily grazed native rangelands; they used burned fields primarily for night roosting. Alkali flats were the most favored habitat, where available; the use of cultivated land may be a result of loss of native habitats; native habitats may be critical in fall before freshly cultivated fields become available. Breed mid-March to late-July.	No	Suitable habitat is not present within the Plan Area. There are no previously recorded occurrences within a ten-mile radius of the Plan Area.
Sternula antillarum California least tern	FE; MNBMC	SE	Summer/nesting in Bay Area; isolated colony in San Francisco Bay on sandy beaches bordering shallow water in estuaries; bulk of distribution in southern California coast. The least tern arrives at its breeding grounds in late April. The breeding colonies are not dense and may appear along either marine or estuarine shores, or on sand bar islands in large rivers, in areas free from humans or predators. Nests are situated on barren to sparsely vegetated	No	Suitable habitat is not present within the Plan Area. There are two previously recorded occurrences within a five-mile radius of the Plan Area and one additional occurrence within a ten-mile radius of the Plan Area.

Scientific Name Common Name	Status Federal[1]	State[2]	Habitat Description[3]	Considered in Impact Analysis	Rationale
			places near water, normally on sandy or gravelly substrates.		
FALCONIFORMES (hawks, falcons)					
Aquila chrysaetos Golden eagle	MNBMC; Bald and Golden Eagle Protection Act	CFP	A large raptor. Found generally in open country including prairies, arctic and alpine tundra, open wooded country, and barren areas, especially in hilly or mountainous regions. Nests on rock ledge of cliff or in large tree (e.g., oak or eucalyptus in California). Pair may have several alternate nests. Egg dates: peak late February-March, California to Texas (but earlier nesting may yield young ready to fly as early as March 1 in Texas).	No	Suitable habitat is not present within the Plan Area. There is one previously recorded occurrence within a one-mile radius of the Plan Area.
Buteo regalis Ferruginous hawk	MNBMC	CSC	Ferruginous hawks are birds of open country. They are found in open habitats, such as grasslands, sagebrush, deserts, shrublands, and outer edges of pinyon-pine and other forests. They select rocky outcrops, hillsides, rock pinnacles, or trees for nest sites.	No	Suitable habitat is not present within the Plan Area. There is one previously recorded occurrence within a ten-mile radius of the Plan Area.
Buteo swainsoni Swainson's hawk	MNBMC	ST	Breeds in stands with few trees in Juniper-sage flats, riparian areas, and in oak savannah. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations. Nests in valley oaks, cottonwoods, willows and a variety of other trees often in, or near, riparian habitats; forages in grasslands, irrigated pastures, and a variety of agricultural row and field crops; shows a preference for alfalfa. Breeds late March to late August.	No	Suitable nesting habitat is not present within the Plan Area. There are no previously recorded occurrences within a ten-mile radius of the Plan Area.

Scientific Name Common Name	Status Federal[1]	State[2]	Habitat Description[3]	Considered in Impact Analysis	Rationale
Circus cyaneus Northern harrier	MNBMC	CSC	Meadows, grasslands, open rangelands, desert sinks, fresh and saltwater emergent wetlands. Nests on ground, usually at marsh edge. Mostly nests in emergent wetland or along rivers or lakes, but may nest in grasslands, grain fields, or on sagebrush flats several miles from water. Breeds April to September.	No	Suitable habitat is not present within the Plan Area. There are no previously recorded occurrences within a ten-mile radius of the Plan Area.
Elanus leucurus White-tailed kite	~	CFP	Nests in shrubs (in Delta) and trees adjacent to grasslands oak woodland, edges of riparian habitats. Roosts communally, resident year-round, and breeds February-October.	No	Suitable habitat is not present within the Plan Area. There is one previously recorded occurrence within a ten-mile radius of the Plan Area.
Falco peregrinus anatum American peregrine falcon	FD; MNBMC	SE; CFP	Generally, the peregrine falcon is found in open habitats from tundra, savannah, and coastal areas to high mountains. It is most commonly associated with tall cliffs with wide open views which are used for perching and nesting and usually near a water source. Cliffs, ledges, caves, or small holes with protection from the weather provide nesting sites. Typically, this species breeds in woodland, forest, and coastal habitats.	No	Suitable nesting habitat is not present within or surrounding the Plan Area. There is one previously recorded occurrence within a ten-mile radius of the Plan Area.
Haliaeetus leucocephalus Bald eagle	FD; MNBMC; Bald and Golden Eagle Protection Act	SE; CFP	Permanent resident, and uncommon winter migrant, now restricted to breeding mostly in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity cos. Ocean shore, lake margins, and rivers, both nesting and wintering. Build stick nests within large tall trees and typically within 1 mile of permanent water. Wintering populations along major rivers and reservoirs in Yuba County. Breeds February to July.	No	Suitable habitat is not present within the Plan Area. There are no previously recorded occurrences within a ten-mile radius of the Plan Area.

Scientific Name Common Name	Status Federal[1]	State[2]	Habitat Description[3]	Considered in Impact Analysis	Rationale
GRUIFORMES (rails, cranes)					
Coturnicops noveboracensis Yellow rail	MNBMC	CSC	The yellow rail occurs year round in California, but in two primary seasonal roles: currently as a very local breeder in the northeastern interior and as a winter visitor (early Oct to mid-Apr) on the coast and in the Suisun Marsh region. The breeding season probably extends from May through early September. For breeding, yellow rails require sedge marshes/meadows with moist soil or shallow standing water. Presence of senescent vegetation was considered an important requirement for nests. Throughout its range, the loss of habitat is probably the greatest threat to populations of the yellow rail (Shuford and Gardali, 2008).	No	Suitable habitat is not present within the Plan Area. There are no previously recorded occurrences within a ten-mile radius of the Plan Area.
Laterallus jamaicensis California black rail	~	ST; CFP	Wetlands, marshes, thickets with recent sightings in near oak foothill woodlands in eastern Yuba County. Nests with eggs have been documented from March to June.	No	Suitable habitat is not present within the Plan Area. There are seven previously recorded occurrence within a five-mile radius of the Plan Area and 14 additional occurrences within a ten-mile radius of the Plan Area.
Rallus longirostris obsoletus California clapper rail	FE; MNBMC	SE; CFP	Salt water and brackish marshes traversed by tidal sloughs in the vicinity of the San Francisco Bay. Typically associated with abundant growths of pickleweed and cordgrass.	No	Suitable habitat is not present within the Plan Area. There are two previously recorded occurrences within a five-mile radius of the Plan Area and nine additional occurrences within a ten-mile radius of the Plan Area.
PASSERIFORMES (perching birds)					

Scientific Name Common Name	Status Federal[1]	State[2]	Habitat Description[3]	Considered in Impact Analysis	Rationale
Agelaius tricolor Tri-colored blackbird	MNBMC	CSC	Breeds in freshwater wetlands, with tall dense vegetation including tule, cattail, blackberry and rose. Forages in grasslands and croplands. Resident year-round. Breeds April to July.	**Yes**	Emergent wetland habitat associated with the detention basin in the central portion of the Plan Area may provide marginally suitable habitat for this species. No tri-colored blackbirds were observed during the field survey conducted by PMC in 2009. There are two previously recorded occurrences within a ten-mile radius of the Plan Area.
Geothlypis trichas sinuosa Saltmarsh common yellowthroat	MNBMC	CSC	Resident of the San Francisco Bay region, in fresh and saltwater marshes. Requires thick, continuous cover down to water surface for foraging and tall grasses, tule patches and willows for nesting.	No	Suitable habitat is not present within the Plan Area. There are three previously recorded occurrence within a five-mile radius of the Plan Area and eight additional occurrences within a ten-mile radius of the Plan Area.
Icteria virens Yellow-breasted chat	MNBMC	CSC	Migrant species that nests in riparian habitats along rivers and streams up to 4,800 feet on the west side of the Sierra Nevada. Breeds May to July.	No	Suitable habitat is not present within the Plan Area. There are no previously recorded occurrences within a ten-mile radius of the Plan Area.
Lanius ludovicianus Loggerhead shrike	MNBMC	CSC	A common resident and winter visitor in lowlands and foothills throughout California. Open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches. Open-canopied valley foothill hardwood, valley foothill hardwood-conifer, valley foothill riparian, pinyon-juniper, juniper, desert riparian, and Joshua tree habitats.	No	Suitable habitat is not present within the Plan Area. There are no previously recorded occurrences within a ten-mile radius of the Plan Area.

Scientific Name Common Name	Status Federal[1]	State[2]	Habitat Description[3]	Considered in Impact Analysis	Rationale
			Egg-laying occurs from March to May.		
Melospiza melodia maxillaris Suisun song sparrow	MNBMC	CSC	Intermixed stands of bulrush (*Scirpus* spp.), cattail (*Typha* spp.), and other emergent vegetation. Suisun song sparrows forage on the bare surface of tidally exposed mud among the tules and along slough margins in the brackish marshes of Suisun Bay during low tides. The Suisun song sparrow is a distinct subspecies completely endemic to Suisun Bay.	No	Suitable habitat is not present within the Plan Area. There are 13 previously recorded occurrence within a five-mile radius of the Plan Area and 10 additional occurrences within a ten-mile radius of the Plan Area.
PELECANIFORMES (pelicans, cormorants)					
Pelacanus occidentalis californicus California brown pelican	FPD; MNBMC	SE	Colonial nester on coastal islands just outside the surf line; nests on coastal islands of small to moderate size which afford immunity from attack by ground-dwelling predators.	No	Suitable habitat is not present within the Plan Area. There are no previously recorded occurrences within a ten-mile radius of the Plan Area.
STRIGIFORMES (owls)					
Asio flammeus Short-eared owl	MNBMC	CSC	Broad expanses of open land with low vegetation for nesting and foraging are required. In general, suitable habitat types include any area that has low vegetation with some dry upland for nesting, and that supports a suitable prey base may be considered potential breeding habitat. Nests on ground generally in a slight depression often beside or beneath a bush or clump of grass. Many nests are near water but are generally on dry sites.	No	Suitable habitat is not present within the Plan Area. There is one previously recorded occurrence within a five-mile radius of the Plan Area.
Athene cunicularia hypugea Western burrowing owl	MNBMC	CSC	This owl inhabits open grasslands and shrub land habitat up to 1,615 meters (5,300 feet) in elevation. This species is typically found in open grassland areas with short vegetation	**Yes**	There are two previously recorded occurrences within a five-mile radius of the Plan Area and 11 additional occurrences within a ten-mile

Scientific Name Common Name	Status Federal[1]	State[2]	Habitat Description[3]	Considered in Impact Analysis	Rationale
			and the presence of small animal burrows. This species utilizes abandoned burrows dug by small mammals such as ground squirrels and badgers for nesting and roosting. This species feeds primarily on large insects and rodents; occasionally on birds and amphibians. The breeding period for this species occurs from March until May. However, the burrowing owl may be found year-round in California.		radius of the Plan Area.
Mammals					
Antrozous pallidus Pallid bat	~	CSC	Pallid bats roost in rock crevices, tree hollows, mines, caves, and a variety of anthropogenic structures, including vacant and occupied buildings and buildings, mines, and natural caves are utilized as roosts. Occurrence is primarily in arid habitats. Colonies are usually small and may contain 12-100 bats.	No	Suitable habitat is not present within the Plan Area. There is one previously recorded occurrence within a five-mile radius of the Plan Area and three additional occurrences within a ten-mile radius of the Plan Area.
Lasiurus blossevillii Western red bat	~	CSC	These bats are found along the west coast and southwestern US and into Mexico where thought to hibernate in the winter. They are solitary creatures that roost in broad leaved trees, especially cottonwoods and willows in the foothills and lower mountains of the southwest and in the fruit and nut orchards of the west, where they resemble dried leaves when they are curled up and asleep. They are often found near streams.	No	Suitable habitat is not present within the Plan Area. There are two previously recorded occurrences within a ten-mile radius of the Plan Area.
Nyctinomops macrotis Big free-tailed bat	~	CSC	This large crevice dweller feeds on insects and can be found in rocky areas, day roosts in rocky cliffs in southern coastal regions.	No	Suitable habitat is not present within the Plan Area. There is one previously recorded occurrence within a ten-mile

Scientific Name Common Name	Status Federal[1]	State[2]	Habitat Description[3]	Considered in Impact Analysis	Rationale
					radius of the Plan Area.
Reithrodontomys raviventris Salt-marsh harvest mouse	FE	SE; CFP	A small, dark brown, terrestrial mouse with a long tail. Confined to the salt marshes around the San Francisco Bay and the Napa, Petaluma, Suisun marshes. It is commonly associated with dense growth of pickleweed (*Salicornia virginica*). The mouse needs access to refuge/cover on high ground, especially during highest tides in winter. This species presumably feeds on seeds of grasses and forbs as well as insects.	No	Suitable habitat is not present within the Plan Area. There are nine previously recorded occurrence within a five-mile radius of the Plan Area and 29 additional occurrences within a ten-mile radius of the Plan Area.
Sorex ornatus sinuosus Suisun shrew	~	CSC	Tidal marshes of the northern shores of San Pablo Bay and Suisun Bay. Requires dense, low-lying cover and driftwood and other litter above the mean high tide line for nesting and foraging.	No	Suitable habitat is not present within the Plan Area. There is one previously recorded occurrence within a ten-mile radius of the Plan Area.
Taxidea taxus American badger	~	CSC	This species is a stout-bodied, primarily solitary species that hunts for ground squirrels and other small mammal prey in open grassland, cropland, deserts, savanna, and shrubland communities. These badgers have large home ranges and spend inactive periods in underground burrows. The mating period for this species typically occurs from mid- to late summer with young born between March and April.	No	Suitable habitat is not present within the Plan Area. There are no previously recorded occurrences within a ten-mile radius of the Plan Area.
Vulpes macrotis mutica San Joaquin kit fox	FE	ST	The San Joaquin kit fox inhabits alkali sink, valley grassland and foothill woodland areas. This fox typically hunts in areas with low, sparse vegetation, which allows for good visibility and mobility. This species burrows in the ground to form underground dens, which are used throughout the year.	**Yes**	Suitable denning habitat is not present within the Plan Area. There are two previously recorded occurrences within a five-mile radius of the Plan Area and two additional occurrences

Scientific Name Common Name	Status Federal[1]	State[2]	Habitat Description[3]	Considered in Impact Analysis	Rationale
			Typically, dens have multiple entrances. Sometimes, man-made structures such as pipes or culverts may be used as den sites by this species. This mating period for this species occurs in winter and litters are usually comprised of four to seven young, which are born from February to March.		within a ten-mile radius of the Plan Area.

CODE DESIGNATIONS

Federal status[1] (Jan 2009):	State status[2] (Jan 2009):
ESU = Evolutionary Significant Unit is a distinctive population.	**SE** = Listed as endangered under the California Endangered Species Act
FE = Listed as endangered under the Endangered Species Act	**ST** = Listed as threatened under the California Endangered Species Act
FT = Listed as threatened under the Endangered Species Act	**CSC** = Species of Concern as identified by the CDFG
FC = Candidate for listing (threatened or endangered) under Endangered Species Act	**CFP** = Listed as fully protected under CDFG code
FPD = Federally Proposed to be Delisted	
MNBMC = Migratory Nongame Bird of Management Concern, protected under the Migratory Bird Treaty Act	
Habitat description[3]: Habitat description information adapted from CNDDB (CDFG 2009) and NatureServe (NatureServe 2008)	

References

California Department of Fish and Game (CDFG). 2009. California Natural Diversity Database (CNDDB) Rarefind 3 computer program, Version 3.1.0. Commercial Version 3.1.1, dated March 1, 2009. Information expires September 1, 2009. CDFG, Biogeographic Data Branch. Sacramento, CA.

NatureServe. 2008. NatureServe Explorer (online edition). Version 7.0 (1 February 2008). Ecological systems data last updated June 2008. All other data last updated February 2008. Accessed on January 16, 2009 from http://www.natureserve.org/

National Marine Fisheries Service (NMFS). 1996. Proposed endangered status for five ESUs of steelhead and proposed threatened status for five ESUs of steelhead in Washington, Oregon, Idaho, and California. Federal Register 61(155):41541-61.

National Oceanic and Atmospheric Association (NOAA) Fisheries Service. 2009. "Green Sturgeon (*Acipenser medirostris*)" website. Office of Protected Resources. Accessed online March 13, 2009 at http://www.nmfs.noaa.gov/pr/species/fish/greensturgeon.htm#distribution

APPENDIX G-3:
SPECIES OBSERVED WITHIN THE PLAN AREA FOR THE CITY OF PITTSBURG BART MASTER PLAN DURING THE APRIL 28, 2009 SURVEY

TABLE C-1 – PLANT SPECIES OBSERVED WITHIN THE PLAN AREA

Scientific Name	Common Name	Indicator Status
Amsinckia sp.	Fiddleneck	UPL
Avena fatua	Wild oat	UPL
Baccharis pilularis	Coyote brush	UPL
Brassica rapa	Field mustard	UPL
Bromus hordeaceus	Soft-chess brome	FACU-
Carduus pycnocephalus	Italian thistle	UPL
Castilleja sp.	Indian paintbrush	UPL
Cirsium vulgare	Bull thistle	FACU
Cynodon dactylon	Bermuda grass	FAC
Erodium macrophyllum	Round-leaved filaree	UPL
Foeniculum vulgare	Fennel	FACU
Hemizonia fitchii	Fitch's tarweed	UPL
Lolium multiflorum	Italian wild rye	FAC*
Lupinus sp.	Lupine	UPL
Medicago sp.	Clover	UPL
Raphanus raphanistrum	Wild radish	UPL
Rumex crispus	Curly dock	FACW-
Salsola tragus	Russian thistle	FACU+
Silybum marianum	Milk thistle	UPL
Typha latifolia	Common cattail	OBL
Vicia sp.	Vetch	UPL

Code	Indicator Status	Definition
OBL	Obligate Wetland	Nearly always occur in wetlands (greater than 90% occurrence)
FACW	Facultative Wetland	Usually occur in wetlands, but may occur in non-wetlands (67% to 89% occurrence)
FAC	Facultative	Occur about equally in wetlands and non-wetlands (34% to 66% occurrence)
FACU	Facultative Upland	Occur predominantly in non-wetlands (1% to 33% occurrence)
UPL	Upland	Rarely occurs in wetlands (less than 1% occurrence)
NI	No Indicator	No indicator has been assigned due to a lack of information
NOL	Not on the list	Assigned to plant species not in the list of synonyms or simply not ranked on the regional list
+		A "+" indicates that a species has a greater chance to occur in wetlands in this region
-		A "-" indicates that a species has a lesser chance to occur in wetlands in this region
*		The wetland indicator status is tentative based on limited information

TABLE C-2 – WILDLIFE SPECIES OBSERVED WITHIN THE PLAN AREA

Scientific Name	Common Name	Evidence
Reptiles		
Sceloporus occidentalis	Western fence lizard	Directly Observed
Birds		
Aphelocoma californica	Western scrub jay	Directly Observed
Carpodacus mexicanus	House finch	Directly Observed
Columba livia	Rock pigeon	Directly Observed
Corvus brachyrhynchos	American crow	Directly Observed
Euphagus cyanocephalus	Brewer's blackbird	Directly Observed
Falco sparverius	American kestrel	Directly Observed
Mimus polyglottos	Northern mockingbird	Directly Observed
Passer domesticus	House sparrow	Directly Observed
Sayornis nigricans	Black phoebe	Directly Observed
Sturnella neglecta	Western meadowlark	Directly Observed
Sturnus vulgaris	European starling	Directly Observed
Turdus migratorius	American robin	Directly Observed
Zenaida macroura	Mourning dove	Directly Observed
Mammals		
Thomomys bottae	Botta's pocket gopher	Gopher mounds
Microtus californicus	California vole	Directly Observed
Lepus californicus	Black-tailed jackrabbit	Directly Observed
Spermophilus beecheyi	California ground squirrel	Heard, burrows observed

APPENDIX H: WATER SUPPLY ASSESSMENT

Pittsburg/Bay Point BART Master Plan

Water Supply Assessment

April 26, 2010

Introduction

Background

The California Water Code requires coordination between land use lead agencies and public water purveyors to ensure that prudent water supply planning has been conducted and that planned water supplies are adequate to meet both existing and planned future project demands. Senate Bill 610 amended state law, effective January 1, 2002, to improve the link between information on water supply availability and certain land use decisions made by cities and counties. The statute requires detailed information regarding water availability to be provided to the city and county decision-makers prior to approval of specified large development projects. The statute also requires this detailed information be included in the administrative record that serves at the evidentiary basis for an approval action by the city or county on such projects.

Water Code Section 10910-10915 requires land use lead agencies to identify the public water system that may supply water for a proposed development project and to request from said public water system a water supply assessment (WSA) for the project. The purpose of the WSA is to demonstrate that the public water system has sufficient water supplies to meet the water demands associated with the proposed project in addition to meeting the existing and planned future water demands projected for the next 20 years.

The City of Pittsburg is currently considering approval of the proposed Pittsburg/Bay Point BART Master Plan. This Master Plan includes an EIR, pursuant to the requirements of CEQA[1], outlining the environmental effects of implementation of the Master Plan, including any effects to water supply, demand, and the physical impacts of installation of water supply infrastructure (pipes, reservoirs, etc.). The following Water Supply Assessment has been prepared for the City of Pittsburg pursuant to the California Water Code.

The Proposed Project

The City of Pittsburg Planning Division is preparing a Master Plan that, if adopted, would guide future development of approximately 50.6 acres in the vicinity of the Pittsburg/Bay Point BART station. The Pittsburg Bay Point BART Master Plan would describe allowed land uses and densities, transportation and circulation improvements, pedestrian pathways and improvements, urban design guidelines and standards, infrastructure development and financing, and phasing

[1] California Environmental Quality Act, California Public Resources Code, Division 13, Environmental Quality (CEQA)

and implementation policies and guidelines. If adopted, the Master Plan would guide all new development in the Master Plan Area.

The proposed project is located in the western portion of the City of Pittsburg, approximately 700 hundred feet southwest of the intersection of State Route (SR) 4 and Bailey Road. The Master Plan Area is bounded by SR 4 to the north, the Oak Hills shopping center to the east, West Leland Road to the south, and the Alves Ranch project area to the west. The approximately 50.6-acre Master Plan Area encompasses Assessor's Parcel Numbers (APN's) 097-160-044, 097-160-045, 097-160-049 and the majority of 097-160-041. The portion of APN 097-160-041 that lies outside the Master Plan Area contains the approach and exit ramps for the BART station, features that will not be modified by the proposed Master Plan. The incorporated boundary of the City of Pittsburg is located along SR 4, just north of the Master Plan Area. The area north of SR 4 lies within unincorporated Contra Costa County in the community of Bay Point.

The proposed project is a Master Plan describing mixed-use development on approximately 50.6 acres. The proposed Master Plan includes provisions for development of residential and commercial uses, including various densities of residential development, senior housing, retail and office uses, and integration of the BART station into a cohesive mixed-use development plan. Current surface parking will be relocated to parking structures, allowing for urban development of the remainder of the project area. The western half of the project would likely be developed as multi-family housing by the current property owner, West Coast Home Builders.

The proposed Master Plan does not include any specific proposals or designs for development; rather, it includes a range of uses and development standards and requirements for future development expected to occur within the Master Plan Area. According to the assumed development expected to occur following adoption of the Master Plan, the Master Plan would result in the construction of 1,168 multi-family dwelling units as well as approximately 146,362 square feet of non-residential uses employing approximately 1,300 people.

Objective of the WSA

This WSA is intended to determine whether the City of Pittsburg and its wholesale water supplier, the Contra Costa Water District, have sufficient planned water supplies to meet the water demands associated with the proposed project, in addition to meeting the existing and planned future water demands of the City projected for the next 20 years, pursuant to the requirements of Senate Bill 610 and the California Water Code.

Water Supply Assessment

The California Water Code (Sections 10910 – 10915) describes the specific requirements of a water supply assessment. This WSA is structured accordingly.

Is the Project Subject to SB610? (Water Code Section 10912 [a] or [b])

The proposed project is subject to CEQA, as determined by the City of Pittsburg and described in the Notice of Preparation for the EIR issued December 7, 2010. Furthermore, any project that includes residential development of 500 or more units would constitute a "project" under California Water Code Section 10912(a). Therefore, the proposed Master Plan is a project under CEQA, and under the California Water Code, the project is subject to SB 610.

Who Will Prepare the SB 610 WSA? (Water Code Section 10910[b])
The City of Pittsburg provides treated water supply to all land uses within the City limits. A public water system is defined by Water Code Section 10912 as any purveyor providing service to 3,000 or more connections. As the City of Pittsburg serves as the water provider inside City limits and as they have many more than 3,000 connections, the City is a "public water system". According to Water Code Section 10910, the public water system shall prepare a WSA.

Has an assessment already been prepared for the project? (Water Code Section 10910[h])
No.

Is There a Current Urban Water Management Plan? (Water Code Section 10910[c])
Yes. The City of Pittsburg adopted an Urban Water Management Plan (UWMP) in 2005. The facts and findings of that UWMP are hereby incorporated by reference into this WSA.

Documenting Wholesale Water Supply (Water Code Section 10910[d])
Wholesale raw water is provided to the City of Pittsburg by the Contra Costa Water District (CCWD). CCWD adopted their own UWMP in 2005. According to the CCWD UWMP, the following water supplies have been/will be available:

- 2005: 210,100 acre-feet
- 2010: 240,300 acre-feet
- 2015: 244,200 acre-feet
- 2020: 246,500 acre-feet
- 2025: 249,100 acre-feet
- 2030: 251,600 acre-feet

CCWD has a contract with the U.S. Bureau of Reclamation for 195,000 acre-feet/year of Central Valley Project (CVP) water. In March 2005, CCWD renewed their water service contract with the U.S. Bureau of Reclamation for a period of 40 years, through February 2045. Raw water supplies are distributed to the City of Pittsburg via the Contra Costa Canal. CCWD indicates that the canal along with currently planned improvements will provide adequate capacity to deliver projected future raw water flows from CCWD to the City of Pittsburg. As such, no additional infrastructure is required to provide raw water to the City through 2030 as a result of this project.

Documenting Water Supply (Ibid.)
The City of Pittsburg receives the majority of its water supply as raw water from the CCWD, the wholesale water supplier for the City. The City then treats the raw water in its water treatment plant before distributing it to customers through the City's networks of water mains and holding tanks. The remainder of water in the City is sourced from the City's two existing groundwater

wells. **Table 1,** representing data provided by the City's UWMP, outlines both historic and projected future water supplies in the City.

TABLE 1
PAST, CURRENT, AND PROJECTED WATER SUPPLIES (ACRE-FEET PER YEAR)

Water Supply Source	2000	2005	2010	2015	2020	2025	2030
Wholesale Water Supply (From CCWD)	9,190	11,552	12,599	13,802	15,201	16,631	18,190
City-Produced Groundwater	1,336	1,000	1,000	1,000	1,000	1,000	1,000
Transfers In or Out	0	0	0	0	0	0	0
Exchanges In or Out	0	0	0	0	0	0	0
Recycled Water*	0	70	70	70	70	70	70
Recycled Water Used for Ground Water Recharge	0	0	0	0	0	0	0
Desalination	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0
Total	**10,526**	**12,622**	**13,669**	**1,4872**	**16,271**	**17,701**	**19,260**

Source: City of Pittsburg, 2005
Notes: *Not included in total.

The City of Pittsburg is within the CCWD service area and purchases raw water from CCWD. The City of Pittsburg provides the remaining amount needed to meet demand from two existing groundwater wells within City limits. Additional details as to relationships between the City of Pittsburg and CCWD as well as the use of groundwater in the City is included in the UWMP, adopted by the City in 2005 and incorporated by reference herein.

Documenting Groundwater Supply (Water Code Section 10910)

The City of Pittsburg currently operates two municipal wells, which are currently producing about 1,000 acre-feet of groundwater per year. Each of these relatively shallow wells (approximately 200 feet deep) delivers approximately 700 gallons of groundwater per minute. The City conducts regular tests of the water pumped from these two wells in compliance with State of California water quality standards (Administrative Code, Title 22) to make sure that the utilization of this water source is consistent with applicable State water standards. **Table 2** below shows the past production of both wells.

TABLE 2
ANNUAL WELL PRODUCTION (ACRE-FEET)

Well	Year										
	1994	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
Rossmoor	n/a	n/a	n/a	1,159	755	791	893	238	781	687	805
Ballpark	n/a	n/a	n/a	705	693	444	443	2	234	3	49
Total	**2,103**	**1,816**	**1,615**	**1,864**	**1,448**	**1,235**	**1,336**	**240**	**1,015**	**690**	**854**

Source: City of Pittsburg, 2005

According to the Department of Water Resources Bulletin 118, the City is drawing from the Pittsburg Plain groundwater basin, described in Table 18, San Francisco Bay Hydrologic Region Groundwater Data of that document (p 135). According to the California Water Plan, Bulletin 160-98, the San Francisco Bay Hydrologic Region has not and is not expected to experience any overdraft conditions.

As described in the City's UWMP, groundwater supply is adequate to serve the City; however, better water quality is currently sought by the City given the mineral content of the existing wells. The UWMP outlined a plan to add up to two additional wells in the City, an effort which was recently completed with the replacement of the City Park well with a new well near Bodega Court in the City (see attached Water Supply Permit Amendment No. 02-04-09PA-02).

Water Supply Infrastructure

The future developers of the Master Plan Area, likely to include West Coast Home Builders and any developer selected by BART for any number of individual projects within their portion of the Master Plan Area, will provide the capital required for construction of connections between the Master Plan Area and City of Pittsburg water mains. These connections, outlined in the Master Plan itself, are likely to include two connections to the existing main under West Leland Road, immediately adjacent to the Master Plan Area. City construction and utility connection permits will be required prior to construction of these connections.

Documenting Project Demand (Water Code Section 10910)

The City's UWMP incorporated demand factors from the City's General Plan as well as known and proposed projects existing at that time. This included assumptions for the various land uses described by the General Plan. The General Plan describes the Master Plan Area as Mixed Use. The development intensity and density of this mixed use was utilized to determine the likely water demand of the City, including the Master Plan Area. As the proposed Master Plan allows for a lower density than originally described by the General Plan[2], the proposed Master Plan would have a much lower water demand than originally assumed in the UWMP.

The actual water demand of the proposed Master Plan was formulated by the City's consultant as part of the preparation of the Master Plan itself. In order to estimate the quantity of water

[2] General Plan Residential Density: 65 DU/Acre. Master Plan Residential Density: 15.4 DU/Acre. General Plan Floor Area Ratio (FAR): 1.0. Master Plan FAR: 0.2.

required to serve the uses of the Master Plan, the City's consultant undertook an analysis of projected uses and their water needs. Demand rates were determined according to standard criteria utilized by the City and CCWD and then applied to each land use. Multi-family residential uses were anticipated to require 340 gallons per day (gpd) per dwelling unit. Nonresidential uses were anticipated to require 2,000 gpd per acre of nonresidential land use, except for the on-site park, which is expected to require 2,500 gpd. The anticipated average water usage per day of the proposed Master Plan is shown in **Table 3** below.

TABLE 3
ANTICIPATED WATER DEMAND OF THE PROPOSED MASTER PLAN

Phase/Property	Water Demand (gpd)	Water Demand (acre feet per year)
Phase 1/BART	38,540	43
Phase 2/BART	8,300	9
Phase 3/BART	53,040	59
Phase 4/BART	12,240	14
Phase 5/BART	40,420	45
WCHB	254,320	285
TOTAL	**406,860**	**455**

The overall water demand in the City of Pittsburg was outlined in the City's UWMP, which analyzed water demand based on the land use patterns and projections in the City of Pittsburg General Plan. As noted above, the allowable densities and FAR for the subject site are much higher in the General Plan than in the proposed Master Plan development scenario; therefore, the proposed development would fall under the water demand analyzed within the UWMP for the area.

The comparison of demand based on General Plan assumptions of development versus supply is provided in **Table 4** below.

TABLE 4
PROJECTED SUPPLY AND DEMAND COMPARISON – PITTSBURG UWMP

Year and Condition	Total Demand	Available Supply	Supply Deficit	
		CCWD and Groundwater	Percent	Acre/Feet/Year
2005				
Normal	12,622	13,622	0	0
2010				
Normal	13,669	13,669	0	0
Single-Year Drought	13,669	13,669	0	0
Multi-Year Drought (yr 1)	13,669	13,669	0	0
Multi-Year Drought (yr 2)	13,669	13,023	5.1	646
Multi-Year Drought (yr 3)	13,669	11,769	15	1,900
2015				
Normal	14,872	14,872	0	0
Single-Year Drought	14,872	14,872	0	0
Multi-Year Drought (yr 1)	14,872	14,872	0	0
Multi-Year Drought (yr 2)	14,872	14,137	5.3	735
Multi-Year Drought (yr 3)	14,872	12,791	15	2,081
2020				
Normal	16,271	16,271	0	0
Single-Year Drought	16,271	16,271	0	0
Multi-Year Drought (yr 1)	16,271	16,271	0	0
Multi-Year Drought (yr 2)	16,271	15,401	5.7	870
Multi-Year Drought (yr 3)	16,271	13,980	15	2,291
2025				
Normal	17,701	17,701	0	0
Single-Year Drought	17,701	17,701	0	0
Multi-Year Drought (yr 1)	17,701	17,701	0	0
Multi-Year Drought (yr 2)	17,701	16,699	6	1,002
Multi-Year Drought (yr 3)	17,701	15,196	15	2,505
2030				
Normal	19,260	19,260	0	0
Single-Year Drought	19,260	19,260	0	0
Multi-Year Drought (yr 1)	19,260	19,260	0	0
Multi-Year Drought (yr 2)	19,260	18,128	6.2	1,132
Multi-Year Drought (yr 3)	19,260	16,521	15	2,739

Source: City of Pittsburg, 2005.

In order to account for deficits shown in Table 4 above, the City included in the UWMP a series of conservation measures, the use of recycled water, and demand reduction plans that would allow for the City to meet the multi-year drought demand of its customers. It was the determination of the UWMP that these measures would be adequate to ensure service to customers during severe (multi-year) drought years.

Is the projected water supply sufficient for the proposed project?
According to the findings of the City's UWMP, the UWMP for CCWD, and the data presented above, it is the determination of the City that water supply is and will be adequate to serve the uses of the proposed Master Plan, pursuant to the requirements of the California Water Code.

References

California Department of Water Resources. 1998. California Water Plan Update: Bulletin 160-98.

California Department of Water Resources. 2003. California's Groundwater: Bulletin 118.

City of Pittsburg. 2005. Urban Water Management Plan.

Contra Costa Water District. 2005. Urban Water Management Plan.

State of California. 2010. California Water Code.

State of California—Health and Human Services Agency
California Department of Public Health

MARK B HORTON, MD, MSPH
Director

ARNOLD SCHWARZENEGGER
Governor

December 2, 2009

Mr. Hilario Mata
Civil Engineer II
City of Pittsburg
65 Civic Ave
Pittsburg CA 94565

WATER SUPPLY PERMIT AMENDMENT FOR BODEGA WELL
CITY OF PITTSBURG WATER SYSTEM (SYSTEM NO. 0710008)

Dear Mr. Mata:

You submitted an application dated July 24, 2009 to amend the water supply permit for the City of Pittsburg water system to add Bodega Well as an active source of supply. The Department has completed the permit amendment investigation and permit amendment number 02-04-09PA-02 is enclosed. Bodega Well is now an active source of supply for the City of Pittsburg water system and may be used to supply raw water to the Pittsburg Water Treatment Plant.

Discussion

In conducting the permit amendment investigation for Bodega Well, the Department reviewed the drinking water source assessment, plans and specification for the Bodega Well and pump station, the well completion report, and water quality data. Department findings are detailed in the enclosed report. The Department determined that the Bodega Well construction meets regulatory requirements and City of Pittsburg can continue to comply with the California Safe Drinking Water Act while operating Bodega Well. On November 10, 2009 Mr. Eric Swing and Mr. Marco Pacheco, both sanitary engineers with the Department, conducted an inspection of the Bodega Well facility. The inspection confirmed that the source facility was constructed as described in the permit amendment application documents. CDPH reviewed the project as a responsible agency pursuant to CEQA and found that the project is exempt from CEQA and does not require further environmental review.

The enclosed permit amendment is now an integral part of the water supply permit for the City of Pittsburg water system, which remains in effect. The permit amendment authorizes City of Pittsburg to operate Bodega Well subject to provisions.

Blending

The total dissolved solids (TDS) level in water from Bodega Well was 620 mg/L in November 2007. The recommended maximum TDS level for consumer acceptance is 500 mg/L. Your water system is required to provide water with TDS levels not greater than 500 mg/L, whenever possible, as a condition of the permit amendment. It is possible to meet the recommended TDS standards when the TDS level in the Contra Costa Canal is 500 mg/L or less. Please prepare a blending operations plan that describes how your water system will operate the Pittsburg WTP to comply with the recommended maximum TDS level. The blending operations plan must include operational TDS monitoring locations, frequencies, and analytical methods, a description of how blending flow rates will be determined and controlled, and standard procedures for any calculations that operators must make to determine blending flow rates.

Monitoring for Drinking Water Standards Compliance

Your water system must initially monitor Bodega Well more frequently for perchlorate, radionuclides, and VOCs pursuant to 22 CCR §64432.3, §64442, §64445 respectively. A drinking water standards compliance monitoring schedule that includes initial monitoring is in Appendix E of the enclosed report.

The Department reviewed available water quality data from Bodega Well and Rossmoore Well to determine whether samples from Rossmoore Well can represent water quality in Bodega Well. Levels of several water quality parameters were an average of 50 percent different between the two sources. Data are inadequate to determine that Rossmoore and Bodega Wells are producing similar quality water from the same aquifer. Once your water system has additional water quality data for Bodega Well, the Department can reevaluate representative monitoring upon request.

Please monitor Bodega Well according to the schedule in Appendix E of the enclosed report. Once initial monitoring is completed, your water system should include Bodega Well monitoring in the source water monitoring plan required by 22 CCR §64416. Please note that sample analysis for radium-226 and uranium is required if the gross alpha particle activity level plus 95 percent confidence interval exceeds 5 pCi/L. If the first two quarters of monitoring for gross alpha particle activity and radium-228 show levels below the detection limits, then your water system will be eligible to waive the last two quarters of monitoring. If you would like to waive the last two quarters of radioactivity monitoring, please send a written request once you have two quarters of data for gross alpha particle activity and radium-228.

If we can be of further assistance, or if you have any questions, please contact Mr. Eric Swing with this office at (510) 620 3604 or by e-mail at Eric.Swing@cdph.ca.gov.

Sincerely,

Betty Graham, P.E.
Senior Sanitary Engineer
San Francisco District
Drinking Water Field Operations Branch

Enclosures:

Permit Amendment No. 02-04-09PA-02
Permit Amendment Report

cc: Contra Costa County Environmental Health Department (w/out encl.)

Mr. Walter Pease
Assistant Director – Public Works
City of Pittsburg
65 Civic Avenue
Pittsburg, CA 94565-3814

Mr. Richard McDonald
Water Plant Superintendent – Public Works
City of Pittsburg
65 Civic Ave
Pittsburg, CA 94565-3814

STATE OF CALIFORNIA

AMENDMENT TO THE

WATER SUPPLY PERMIT

For The

City of Pittsburg

Public Water System No. 0710008

PERMIT AMENDMENT NUMBER: 02-04-09PA-02 DATE: December 2, 2009

ORIGINAL PERMIT NO. 02-93-025 DATE: August 3, 1993

WHEREAS:

1. The City of Pittsburg submitted an application to the California Department of Public Health on July 24, 2009 for an amendment to public water supply permit no. 02-93-025 issued to the City of Pittsburg on August 3, 1993.
2. The purpose of the amendment, as stated in the application, is to allow the City of Pittsburg to add Bodega Well as a new active water supply source.
3. The City of Pittsburg has submitted all of the supporting information required to evaluate the application.
4. The California Department of Public Health has evaluated the application and the supporting material and has determined that the proposed modifications comply with all applicable State drinking water requirements.

THEREFORE:

The California Department of Public Health hereby approves the application submitted by the City of Pittsburg for a permit amendment. Public water supply permit no. 02-93-025 is hereby amended to add Bodega Well as an active water supply source.

This permit amendment is subject to the following conditions:

1. Pittsburg shall provide water only from approved sources of supply. Approved active sources of supply are the Contra Costa Canal, Rossmoore Well, and Bodega Well. Pittsburg shall not provide water from any other source of supply without prior written approval from the Department.

2. Pittsburg shall provide water with less than 500 mg/L total dissolved solids (TDS) to the distribution system at all times that raw water from the Contra Costa Canal has levels of TDS lower than 500 mg/L. Pittsburg shall develop a blending operations plan for TDS levels by July 1, 2010. The TDS blending operations plan shall include: operational TDS monitoring locations, frequencies, and analytical methods, a description of how blending flow rates will be determined and controlled, and standard procedures for any calculations that operators must make to determine blending flow rates.

3. Pittsburg shall monitor Bodega Well for compliance with drinking water standards according to the schedule in Appendix E. Pittsburg shall update the water quality sampling plan required by 22 CCR §64416 to include Bodega Well compliance monitoring by January 31, 2011.

4. Pittsburg shall cause the laboratories that analyzed samples for compliance with drinking water standards to report all data to the Department electronically. Data from the November 8, 2007 samples shall be reported by January 10, 2010.

5. By June 30, 2010, Pittsburg shall submit a letter to the Department describing the status and future plans for Ballpark Well. If Pittsburg does not maintain Ballpark well for a future use listed in *California Health and Safety Code* §115700, Pittsburg shall destroy Ballpark Well according to the requirements of California Water Well Standards by June 30, 2011. If Ballpark Well is destroyed, Pittsburg shall send a copy of the destruction permit for Ballpark Well to the Department within 60 days after the well is destroyed.

This amendment shall be appended to and shall be considered to be an integral part of public water supply permit number 02-93-025. All conditions of water supply permit number 02-93-025 and the previous permit amendment shall remain in effect. This permit amendment shall be effective as of the date shown below.

FOR THE CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

Betty Graham

Betty Graham, P.E.
Senior Sanitary Engineer
San Francisco District
Drinking Water Field Operations Branch

Dec. 2, 2009
Date

STATE OF CALIFORNIA
APPLICATION
FOR
DOMESTIC WATER SUPPLY PERMIT AMENDMENT
FROM

Applicant: City of Pittsburg

Address: 65 Civic Ave., Pittsburg, CA 94565

System Name: City of Pittsburg Water System

System Number: 0710008

TO: Department of Public Health
Drinking Water Field Operations Branch
850 Marina Bay Pkwy, Bldg. P, 2nd Fl.
Richmond, CA 94804-6403

Pursuant and subject to the requirements of the California Health and Safety Code, Division 104, Part 12, Chapter 4 (California Safe Drinking Water Act), Article 7, Section 116550, relating to changes requiring an amended permit, application is hereby made to amend an existing water supply permit to use the Bodega Well that is tied into an existing raw water line that conveys groundwater to the City's water treatment plant for blending and treatment with the City's surface water source supply. This well is intended to serve as an additional supplemental source of supply to the City.

FOR OFFICIAL USE
Date Received:

I (We) declare under penalty of perjury that the statements on this application and on the accompanying attachments are correct to my (our) knowledge and that I (we) are acting under authority and direction of the responsible legal entity under whose name this application is made.

Signed By: ______________________
Hilario J. Mata

Title: Civil Engineer II

Address: Engineering Dept., 1st Floor
65 Civic Ave., Pittsburg, CA 94565

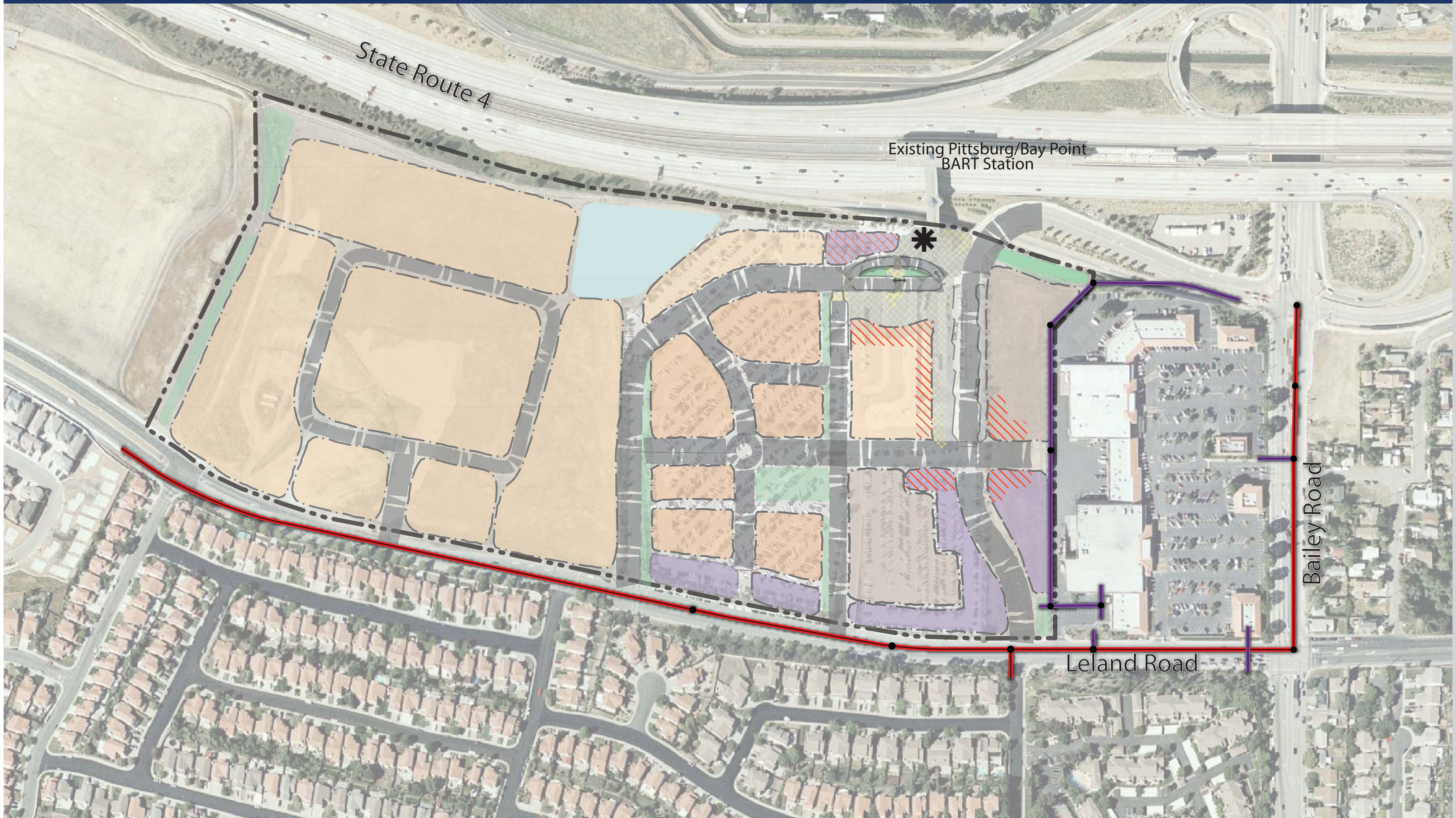
Telephone: 925-252-4951

Dated: July 24, 2009

DDW: 08/2007

APPENDIX I: WASTEWATER ASSESSMENT

Figure X.X
Land Use Plan



legend

6" Existing Sewer Line

8" Existing Sewer Line

BART Entrance

Boundaries

Core Project Area

Land Uses

Detention Basin

Medium Density Residential

High Density Residential

Ground Floor Retail

Flex*

Parking

Parks & Open Space

Urban Plaza

Roadways

* Flex space can be residential, retail, office, public or what the market dictates when the development starts to build out

200 100 0 200

Feet (approximate)

north

Pittsburg/Bay Point BART Master Plan
Pittsburg, California

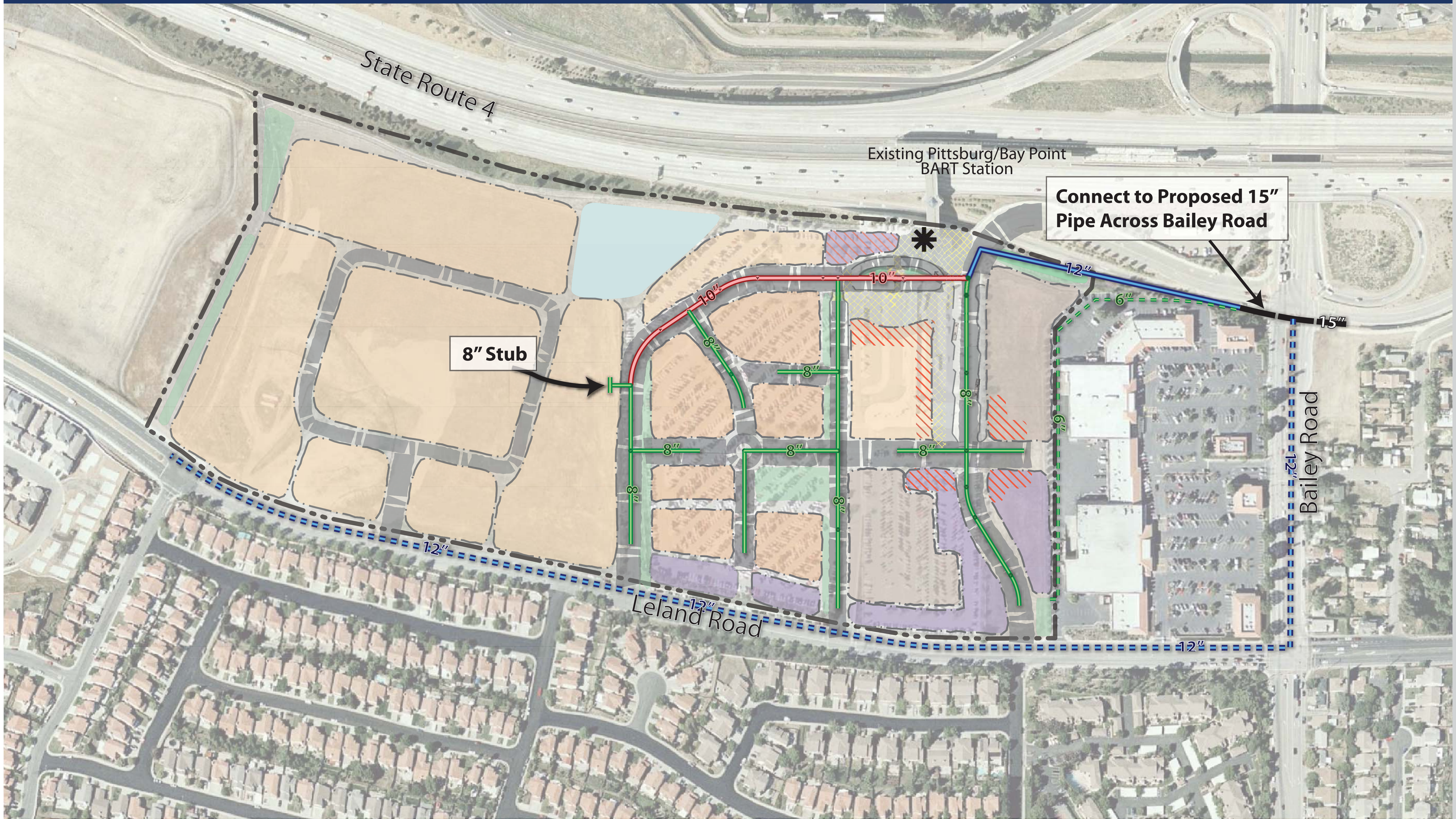
Infrastructure Plan
Existing Sanitary Sewer

Mark Thomas & Company, Inc.
Providing Engineering, Surveying and Planning Services

Sanitary Sewer - Wastewater Flow Table

Land Use	Phase 1		Phase 2		Phase 3		Phase 4		Phase 5		WCHB Site		Total			
	Units or SF	ABWF (gpd)	Units or SF	ABWF (gpd)	Units or SF	ABWF (gpd)	Units or SF	ABWF (gpd)	Units or SF	ABWF (gpd)	Units or SF	ABWF (gpd)	Units or SF	ABWF (gpd)	PWWF (gpd)	PWWF (cfs)
Medium Density Residential	105	17,850	12	2,040	-	-	19	3,230	11	1,870	748	127,160	**895**	**152,150**	**-**	**-**
(170 gpd/Unit)																
High Density Residential	2	300	6	900	156	23,400	9	1,350	101	15,150	-	-	**274**	**41,100**	**-**	**-**
(150 gpd/Unit)																
Retail / Commercial	32,757	3,276	24,916	2,492	-	-	26,484	2,648	11,674	1,167	-	-	**95,831**	**9,583**	**-**	**-**
(100 gpd/1,000 sf)																
Office	3,318	332	8,886	889	-	-	14,218	1,422	7,938	794	-	-	**34,360**	**3,436**	**-**	**-**
(100 gpd/1,000 sf)																
Quasi Public	1,561	156	4,182	418	-	-	6,691	669	3,736	374	-	-	**16,170**	**1,617**	**-**	**-**
(100 gpd/1,000 sf)																
Total Phase Acreage	9.1		3.8		4.8		3.4		4.3		25.2		**50.6**	**AC**	**-**	**-**
Total		**21,914**		**6,738**		**23,400**		**9,319**		**19,355**		**127,160**		**207,886**	**840,146**	**1.30**

Figure X.X
Land Use Plan



legend

- 15" Future Sanitary Sewer
- 12" Sanitary Sewer
- 12" Existing Sanitary Sewer
- 10" Sanitary Sewer
- 8" Sanitary Sewer
- 6" Existing Sanitary Sewer
- BART Entrance

Boundaries

- Core Project Area

Land Uses

- Detention Basin
- Medium Density Residential
- High Density Residential
- Ground Floor Retail
- Flex*
- Parking
- Parks & Open Space
- Urban Plaza
- Roadways

* Flex space can be residential, retail, office, public or what the market dictates when the development starts to build out

200 100 0 200
Feet (approximate)
north

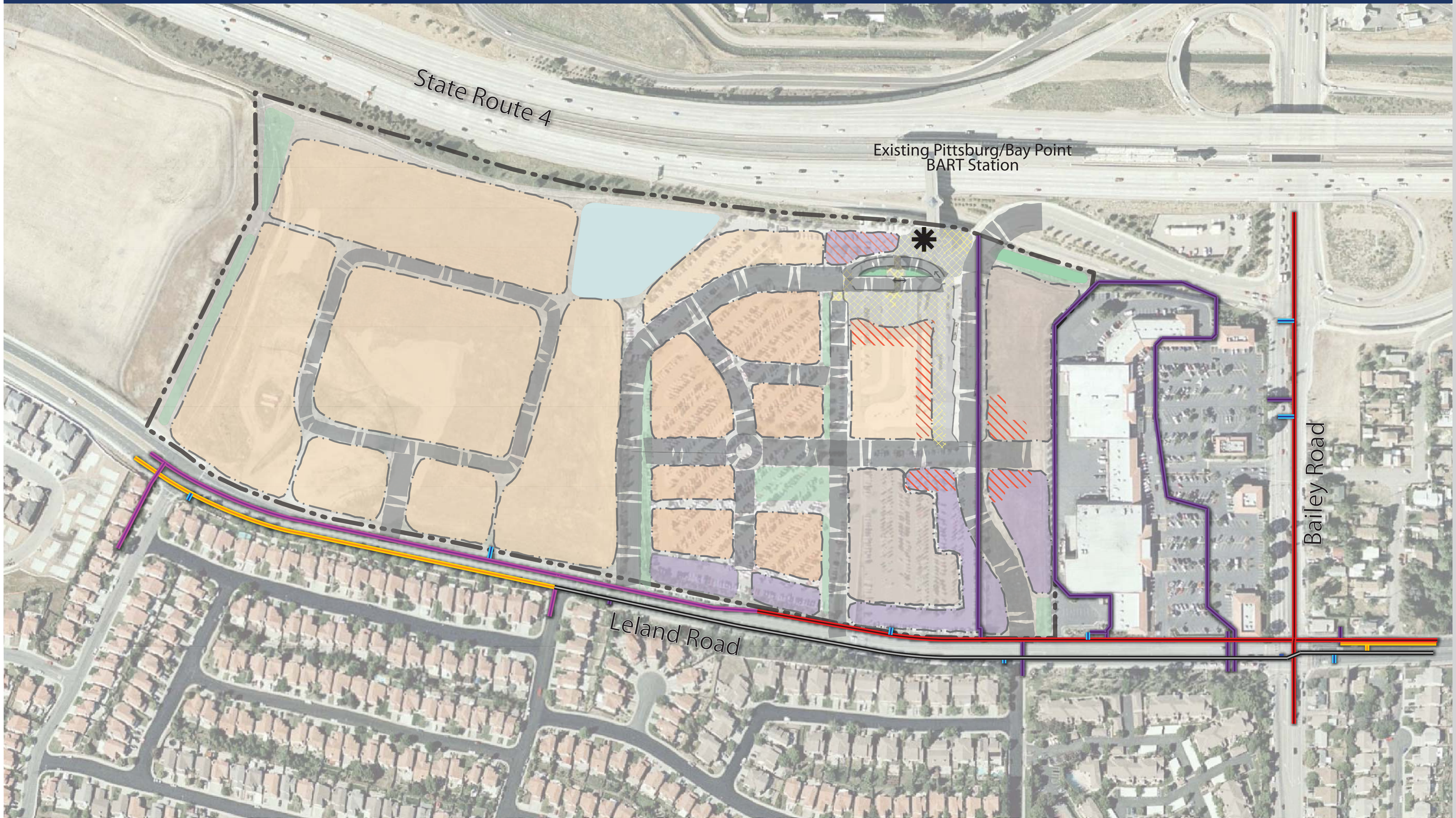
Pittsburg/Bay Point BART Master Plan
Pittsburg, California

Infrastructure Plan
Sanitary Sewer

Mark Thomas & Company, Inc.
Providing Engineering, Surveying and Planning Services

Figure X.X

Land Use Plan



legend

6" Existing Water Line
8" Existing Water Line
12" Existing Water Line
16" Existing Water Line
20" Existing Water Line
24" Existing Water Line

BART Entrance

Boundaries

Core Project Area

Land Uses

Detention Basin
Medium Density Residential
High Density Residential
Ground Floor Retail
Flex*
Parking
Parks & Open Space
Urban Plaza
Roadways

* Flex space can be residential, retail, office, public or what the market dictates when the development starts to build out

200 100 0 200
Feet (approximate)
north

Pittsburg/Bay Point BART Master Plan
Pittsburg, California

Infrastructure Plan
Existing Water

Mark Thomas & Company, Inc.
Providing Engineering, Surveying and Planning Services

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	**Water - Average Day Demand Table**															
2																
3	**Land Use**	**Phase 1**		**Phase 2**		**Phase 3**		**Phase 4**		**Phase 5**		**WCHB Site**		**Total**		
4		**Units or AC**	**Demand (gpd)**	**Units or AC**	**Demand (gpd)**	**Units or AC**	**Demand (gpd)**	**Units or AC**	**Demand (gpd)**	**Units or AC**	**Demand (gpd)**	**Units or AC**	**Demand (gpd)**	**Units or AC**	**Demand (gpd)**	**Demand (MGD)**
5																
6	**Medium Density Residential**	105	35,700	12	4,080	-	-	19	6,460	11	3,740	748	254,320	**895**	**304,300**	**0.3043**
7	*(340 gpd/Unit)*															
8	**High Density Residential**	2	680	6	2,040	156	53,040	9	3,060	101	34,340	-	-	**274**	**93,160**	**0.0932**
9	*(340 gpd/Unit)*															
10	**Retail / Commercial**	0.9400	1,880	0.7150	1,430	-	-	0.7600	1,520	0.3350	670	-	-	**2.7500**	**5,500**	**0.0055**
11	*(2,000 gpd/Ac)*															
12	**Office**	0.0952	190	0.2550	510	-	-	0.4080	816	0.2278	456	-	-	**0.9860**	**1,972**	**0.0020**
13	*(2,000 gpd/Ac)*															
14	**Quasi Public**	0.0448	90	0.1200	240	-	-	0.1920	384	0.1072	214	-	-	**0.4640**	**928**	**0.0009**
15	*(2,000 gpd/Ac)*															
16	**Urban Plaza**	1.1000	-	-	-	-	-	-	-	-	-	-	-	**1.1000**	**-**	**-**
17																
18	**Parking Garage**	-	-	1.5000	-	-	-	1.8000	-	-	-	-	-	**3.3000**	**-**	**-**
19																
20	**Detention Basin**	-	-	-	-	-	-	-	-	-	-	1.8000	-	**1.8000**	**-**	**-**
21																
22	**Park**	-	-	-	-	-	-	-	-	0.4000	1,000	-	-	**0.4000**	**1,000**	**0.0010**
23	*(2,500 gpd/Ac)*															
24	**Roadways & Other**	5.3200	-	1.5500	-	2.2000	-	0.4000	-	1.6300	-	-	-	**11.1000**	**-**	**-**
25																
26	**Total**		**38,540**		**8,300**		**53,040**		**12,240**		**40,420**		**254,320**		**406,860**	**0.4069**

APPENDIX J: GHG ANALYSIS

Bay Point BART
Construction-Generated
Greenhouse Gas Emissions

	CO2 (pounds)	Gallons of Diesel Fuel	N2O (grams)	N2O (pounds)	CH4 (grams)	CH4 (Pounds)	Total CO2e pounds/da
Project Action							
Phase 1							
Construction - 2011	8,867.00	396.27	103	0.227	230	0.507	**8,948.06**
Construction - 2012	7,661.00	342.38	89	0.196	199	0.438	**7,731.03**
Construction - 2013	7,662.00	342.42	89	0.196	199	0.438	**7,732.04**
Construction - 2014	7,690.00	343.67	89	0.197	199	0.439	**7,760.30**
Construction - 2015	27.00	1.21	0	0.001	1	0.002	**27.25**
Phase 2							
Construction - 2015	3,845.00	171.84	45	0.098	100	0.220	**3,880.15**
Construction - 2016	2,103.00	93.98	24	0.054	55	0.120	**2,122.22**
Construction - 2017	2,103.00	93.98	24	0.054	55	0.120	**2,122.22**
Construction - 2018	2,103.00	93.98	24	0.054	55	0.120	**2,122.22**
Phase 3							
Construction - 2018	4,826.00	215.68	56	0.124	125	0.276	**4,870.12**
Construction - 2019	4,827.00	215.72	56	0.124	125	0.276	**4,871.12**
Construction - 2020	4,827.00	215.72	56	0.124	125	0.276	**4,871.12**
Construction - 2021	4,828.00	215.77	56	0.124	125	0.276	**4,872.13**
Construction - 2022	4,828.00	215.77	56	0.124	125	0.276	**4,872.13**
WCHB Phase							
Construction - 2022	11,561.00	516.67	134	0.296	300	0.661	**11,666.68**
Construction - 2023	11,561.00	516.67	134	0.296	300	0.661	**11,666.68**
Construction - 2024	11,561.00	516.67	134	0.296	300	0.661	**11,666.68**
Construction - 2025	11,607.00	518.73	135	0.297	301	0.663	**11,713.10**
Construction - 2026	11,611.00	518.90	135	0.297	301	0.664	**11,717.14**
Phase 4							
Construction - 2026	2,687.00	120.08	31	0.069	70	0.154	**2,711.56**
Construction - 2027	2,974.00	132.91	35	0.076	77	0.170	**3,001.19**
Construction - 2028	2,974.00	132.91	35	0.076	77	0.170	**3,001.19**
Construction - 2029	2,974.00	132.91	35	0.076	77	0.170	**3,001.19**
Phase 5							
Construction - 2029	2,687.00	120.08	31	0.069	70	0.154	**2,711.56**
Construction - 2030	5,251.00	234.67	61	0.135	136	0.300	**5,299.00**
Construction - 2031	5,251.00	234.67	61	0.135	136	0.300	**5,299.00**

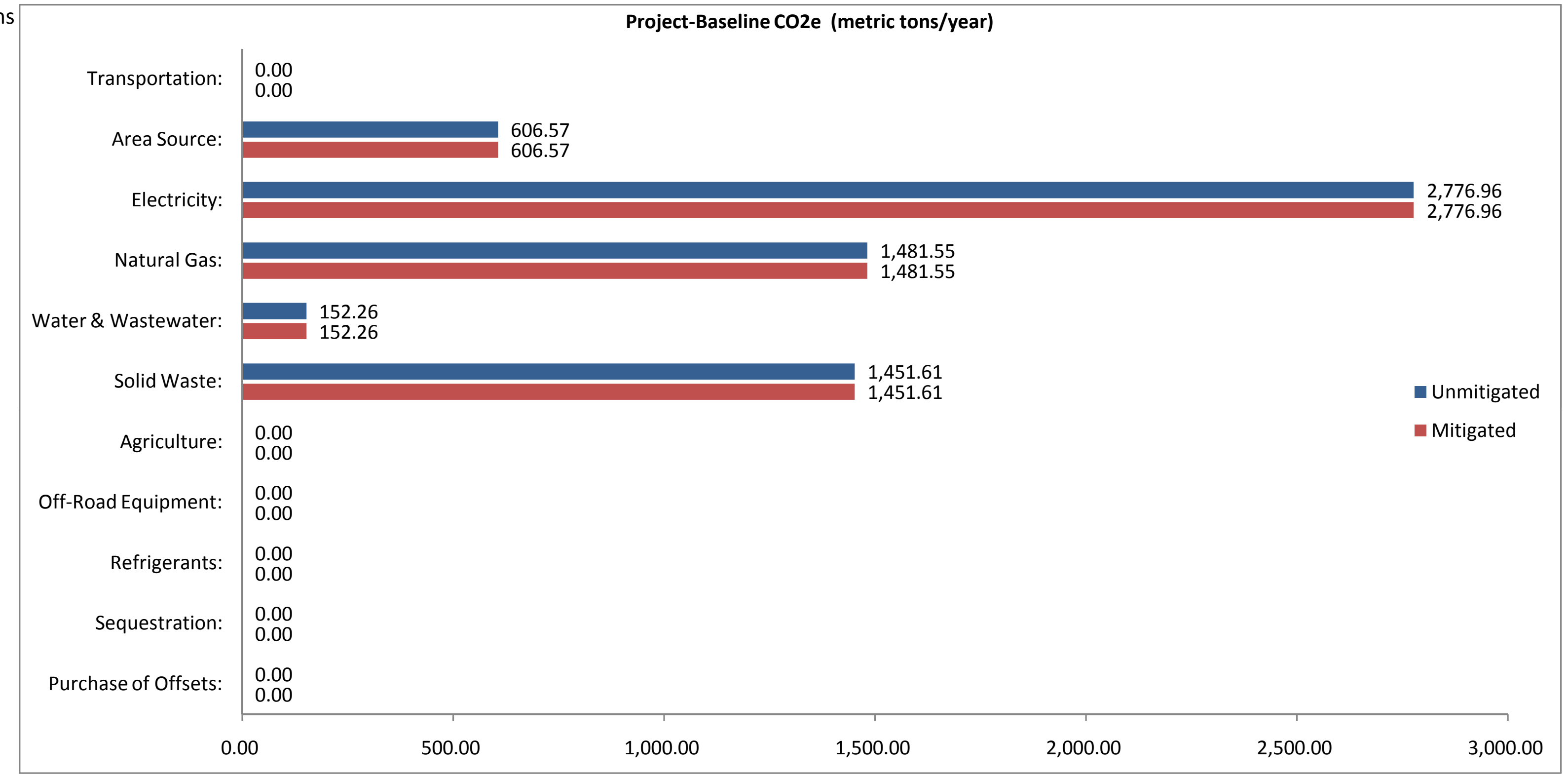
Sources:
Carbon Dioxide Emissions: URBEMIS 2007v.9.2.4; Conversion Ratios: California Climate Action Registry, 2009

Summary Results

Project Name: Pittsburg - Bay Point BART Master Plan - Area Source Emissions
Project and Baseline Years: 2012 N/A

Results	Unmitigated Project-Baseline CO2e (metric tons/year)	Mitigated Project-Baseline CO2e (metric tons/year)
Transportation:	0.00	0.00
Area Source:	606.57	606.57
Electricity:	2,776.96	2,776.96
Natural Gas:	1,481.55	1,481.55
Water & Wastewater:	152.26	152.26
Solid Waste:	1,451.61	1,451.61
Agriculture:	0.00	0.00
Off-Road Equipment:	0.00	0.00
Refrigerants:	0.00	0.00
Sequestration:	N/A	0.00
Purchase of Offsets:	N/A	0.00
Total:	6,468.95	6,468.95

Baseline is currently: **OFF**
Baseline Project Name:
Go to Settings Tab to Turn On Baseline



Detailed Results

Unmitigated	CO2 (metric tpy)	CH4 (metric tpy)	N2O (metric tpy)	CO2e (metric tpy)	% of Total
Transportation*:				0.00	0.00%
Area Source:	561.47	2.02	0.01	606.57	9.38%
Electricity:	2,772.52	0.02	0.01	2,776.96	42.93%
Natural Gas:	1,477.76	0.14	0.00	1,481.55	22.90%
Water & Wastewater:	152.01	0.00	0.00	152.26	2.35%
Solid Waste:	10.61	68.62	N/A	1,451.61	22.44%
Agriculture:	0.00	0.00	0.00	0.00	0.00%
Off-Road Equipment:	0.00	0.00	0.00	0.00	0.00%
Refrigerants:	N/A	N/A	N/A	0.00	0.00%
Sequestration:	N/A	N/A	N/A	N/A	N/A
Purchase of Offsets:	N/A	N/A	N/A	N/A	N/A
Total:				6,468.95	100.00%

Baseline	CO2 (metric tpy)	CH4 (metric tpy)	N2O (metric tpy)	CO2e (metric tpy)	% of Total
Transportation*:				0.00	N/A
Area Source:	0.00	0.00	0.00	0.00	N/A
Electricity:	0.00	0.00	0.00	0.00	N/A
Natural Gas:	0.00	0.00	0.00	0.00	N/A
Water & Wastewater:	0.00	0.00	0.00	0.00	N/A
Solid Waste:	0.00	0.00	N/A	0.00	N/A
Agriculture:	0.00	0.00	0.00	0.00	N/A
Off-Road Equipment:	0.00	0.00	0.00	0.00	N/A
Refrigerants:	N/A	N/A	N/A	0.00	N/A
Sequestration:	N/A	N/A	N/A	N/A	N/A
Purchase of Offsets:	N/A	N/A	N/A	N/A	N/A
Total:				0.00	0.00%

* Several adjustments were made to transportation emissions after they have been imported from URBEMIS.
After importing from URBEMIS, CO2 emissions are converted to metric tons and then adjusted to account for the "Pavley"
regulation. Then, CO2 is converted to CO2e by multiplying by 100/95 to account for the contribution of other GHGs (CH4, N2O, and HFCs [from leaking air conditioners]).
Finally, CO2e is adjusted to account for th low carbon fuels rule.

Mitigated	CO2 (metric tpy)	CH4 (metric tpy)	N2O (metric tpy)	CO2e (metric tpy)	% of Total
Transportation*:				0.00	0.00%
Area Source:	561.47	2.02	0.00	606.57	9.38%
Electricity:	2,772.52	0.02	0.01	2,776.96	42.93%
Natural Gas:	1,477.76	0.14	0.00	1,481.55	22.90%
Water & Wastewater:	152.01	0.00	0.00	152.26	2.35%
Solid Waste:	10.61	68.62	N/A	1,451.61	22.44%
Agriculture:	0.00	0.00	0.00	0.00	0.00%
Off-Road Equipment:	0.00	0.00	0.00	0.00	0.00%
Refrigerants:	N/A	N/A	N/A	0.00	0.00%
Sequestration:	N/A	N/A	N/A	0.00	0.00%
Purchase of Offsets:	N/A	N/A	N/A	0.00	0.00%
Total:				6,468.95	100.00%

Mitigation Measures Selected:

Transportation: Go to the following tab: Transp. Detail Mit for a list of the transportation mitigation measures selected (in URBEMIS)

Electricity: The following mitigation measure(s) have been selected to reduce electricity emissions.

Natural Gas: The following mitigation measure(s) have been selected to reduce natural gas emissions.

Water and Wastewater: The following mitigation measure(s) have been selected to reduce water and wastewater emissions.

Solid Waste: The following mitigation measure has been selected to reduce solid waste related GHG emissions.

Ag: No existing mitigation measures available.

Off-Road Equipment: No existing mitigation measures available.

Refrigerants: The following mitigation measure has ben selected to reduce refrigerant emissions:

Carbon Sequestration: Project does not include carbon sequestration through tree planting.

Emission Offsets/Credits: Project does not include purchase of emission offsets/credits.

Area Source

Baseline is currently: OFF

Unmitigated Area Source

	Project	Baseline	Project-Baseline
Landscaping Emissions from URBEMIS (CO_2 metric tons/year):	1.379	0.000	
Hearth Emissions from URBEMIS (CO_2 metric tons/year):	560.091	0.000	
Wood Burning Fireplaces (N_2O metric tons/year):	0.005	0.000	
Natural Gas Fireplaces (N_2O metric tons/year):	0.003	0.000	
Wood Burning Stoves (CH_4 metric tons/year):	2.013	0.000	
Natural Gas Fireplaces (CH_4 metric tons/year):	0.004	0.000	
Total (CO_2e metric tons/year):	606.572	0.000	
Total (CO_2e metric tons/year):			**606.572**

Mitigated Area Source

	Project	Baseline	Project-Baseline
Landscaping Emissions from URBEMIS (CO_2 metric tons/year):	1.379	0.000	
Hearth Emissions from URBEMIS (CO_2 metric tons/year):	560.091	0.000	
Wood Burning Fireplaces (N_2O metric tons/year):	0.005	0.000	
Natural Gas Fireplaces (N_2O metric tons/year):	0.003	0.000	
Wood Burning Stoves (CH_4 metric tons/year):	2.013	0.000	
Natural Gas Fireplaces (CH_4 metric tons/year):	0.004	0.000	
Total (CO_2e metric tons/year):	606.572	0.000	
Total (CO_2e metric tons/year):			**606.572**

The URBEMIS area source calculations include five separate categories: 1) natural gas fuel combustion, 2) hearth fuel combustion, 3) landscape maintenance equipment, 4) consumer products, and 5) architectural coatings. This Area Source tab imports CO_2 emissions calculated by URBEMIS for hearths and landscape maintenance equipment only. BGM then calculates N_2O and CH_4 emissions for woodstoves and fireplaces and uses the resulting emissions to calculate CO_2e. The consumer products and architectural coatings categories within URBEMIS do not generate GHG emissions and, consequently, are not used by BGM. Also, URBEMIS' estimate of CO_2 from natural gas fuel combustion is not used by BGM. Instead, BGM calculates natural gas use and the resulting CO_2 emissions in the Electricity and Natural Gas tab.

Electricity and Natural Gas

Baseline is currently: OFF

Unmitigated Electricity	Project	Baseline	Project-Baseline
CO2 metric tons/year CO2:	2,772.524	0.000	
CH4 metric tons/year CH4:	0.023	0.000	
N2O metric tons/year:	0.013	0.000	
CO2e metric tons/year:	2,776.962	0.000	
CO2e metric tons/year:			2,776.96

Mitigated Electricity	Project	Baseline	Project-Baseline
CO2 metric tons/year CO2:	2,772.524	0.000	
CH4 metric tons/year CH4:	0.023	0.000	
N2O metric tons/year:	0.013	0.000	
CO2e metric tons/year:	2,776.962	0.000	
CO2e metric tons/year:			2,776.96

Unmitigated Natural Gas	Project	Baseline	Project-Baseline
CO2 metric tons/year:	1477.76	0.000	
CH4 metric tons/year:	0.14	0.000	
N2O metric tons/year:	0.00	0.000	
CO2e metric tons/year:	1481.55	0.000	
CO2e metric tons/year:			1,481.55

Mitigated Natural Gas	Project	Baseline	Project-Baseline
CO2 metric tons/year:	1477.762	0.000	
CH4 metric tons/year:	0.139	0.000	
N2O metric tons/year:	0.003	0.000	
CO2e metric tons/year:	1481.550	0.000	
CO2e metric tons/year:			1,481.55

Project Climate Zone Location: (•) Zone 4 ( ) Zone 5

***** Select Mitigation Measures on the Mitigation Tab ===>** Mitigation

For detailed climate zone map see:
http://capabilities.itron.com/CeusWeb/FCZMap.aspx

Clear All User Overrides

PROJECT Residential:

	Number of units (from URBEMIS)	Estimated Electricity Use/Year (kwh/ residence)	Total Residential Electricity Use (mwh /year)	User Override of Residential Electricity Use (mwh/year)	CO2 (metric tons/year)	CH4 (metric tons/yr)	N20 (metric tons/yr)	Estimated Natural Gas Use (MMBtu/residence/year)	Estimated Natural Gas use (MM Btu/year)	User Override of Natural Gas Use (MM Btu/year)	CO2 (metric tons/yr)	CH4 (metric tons/yr)	N2O (metric tons/yr)	Elec Use	Gas Use
Single Family Residential	0.000	7,415.000	0.000		0.000	0.0000	0.0000	49.600	0.000		0.000	0.000	0.000	0.00	0.00
Multi Family Residential	1,168.000	4,434.000	5,178.912		1,890.491	0.0157	0.0087	22.500	26,280.000		1,391.886	0.131	0.003	5,178.91	26,280.00

PROJECT Nonresidential:

Land Use Type	Square Footage (1,000) from URBEMIS	Estimated Electricty Use/Year (Megawatt-hours)	User Override of Electricity Use/Year (Megawatt-hours)	CO2 (metric tons/yr)	CH4 (metric tons/yr)	N2O (metric tons/yr)	Estimated Natural Gas Use/Year (MM Btu)	User Override of Natural Gas Use (MM Btu/Year)	CO2 (metric tons/yr)	CH4 (metric tons/yr)	N2O (metric tons/yr)	Elect Use	Gas Use	
Day-Care Center	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Elementary School	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Junior High School	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
High School	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Junior College	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
University/College	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Library	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Place of Worship	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
City Park	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Racquet Club	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Racquetball/Health	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Quality Restaurant	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
High Turnover/Sit-Down Restaurant	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Fast Food w/Drive Through	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Fast Food w/o Drive Through	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Hotel	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Motel	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Free-Standing Discount Store	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Free-Standing Discount Superstore	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Discount Club	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Regional Shopping Center	50.53	647.61		236.40	0.0020	0.0011	151.91		8.05	0.00076	0.00002	647.61	151.91	
Electronic Superstore	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Home Improvement Superstore	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Strip Mall	45.30	580.58		211.93	0.0018	0.0010	136.19		7.21	0.00068	0.00001	580.58	136.19	
Hardware/Paint Store	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Supermarket	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Convenience Market	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Convenience Market w/gas pumps	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Gasoline Service Station	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Bank w/Drive Through	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
General Office Building	34.36	807.89		294.91	0.0025	0.0014	906.65		48.02	0.00453	0.00009	807.89	906.65	
Office Park	16.17	380.20		138.79	0.0012	0.0006	426.67		22.60	0.00213	0.00004	380.20	426.67	
Government Office Building	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Government Civic Center	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Pharmacy w/Drive Through	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Pharmacy w/o Drive Through	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Medical Office Building	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Hospital	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Warehouse	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
General Light Industry	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
General Heavy Industry	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Industrial Park	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
Manufacturing	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000	0.00	0.00	
												7,595.20	27,901.42	Unmitigated
												7,595.20	27,901.42	Mitigated
												7,595.20	27,901.42	Mitigated %

BASELINE Residential:

	Number of units (from URBEMIS)	Estimated Electricity Use/Year (kwh/ residence)	Total Residential Electricity Use (mwh /year)	User Override of Residential Electricity Use (mwh/year)	CO2 (metric tons/year)	CH4 (metric tons/yr)	N20 (metric tons/yr)	Estimated Natural Gas Use (MMBtu/residence/year)	Estimated Natural Gas use (MM Btu/year)	User Override of Natural Gas Use (MM Btu/year)	CO2 (metric tons/yr)	CH4 (metric tons/yr)	N2O (metric tons/yr)
Single Family Residential	0.000	7,415.000	0.000		0.000	0.0000	0.0000	49.600	0.000		0.000	0.000	0.000
Multi Family Residential	0.000	4,434.000	0.000		0.000	0.0000	0.0000	22.500	0.000		0.000	0.000	0.000

BASELINE Nonresidential:

Land Use Type	Square Footage (1,000) from URBEMIS	Estimated Electricty Use/Year (Megawatt-hours)	User Override of Electricity Use/Year (Megawatt-hours)	CO_2 (metric tons/yr)	CH_4 (metric tons/yr)	N_2O (metric tons/yr)	Estimated Natural Gas Use/Year (MM Btu)	User Override of Natural Gas Use (MM Btu/Year)	CO_2 (metric tons/yr)	CH_4 (metric tons/yr)	N_2O (metric tons/yr)
Day-Care Center	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Elementary School	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Junior High School	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
High School	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Junior College	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
University/College	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Library	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Place of Worship	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
City Park	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Racquet Club	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Racquetball/Health	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Quality Restaurant	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
High Turnover/Sit-Down Restaurant	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Fast Food w/Drive Through	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Fast Food w/o Drive Through	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Hotel	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Motel	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Free-Standing Discount Store	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Free-Standing Discount Superstore	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Discount Club	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Regional Shopping Center	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Electronic Superstore	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Home Improvement Superstore	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Strip Mall	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Hardware/Paint Store	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Supermarket	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Convenience Market	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Convenience Market w/gas pumps	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Gasoline Service Station	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Bank w/Drive Through	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
General Office Building	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Office Park	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Government Office Building	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Government Civic Center	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Pharmacy w/Drive Through	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Pharmacy w/o Drive Through	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Medical Office Building	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Hospital	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Warehouse	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
General Light Industry	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
General Heavy Industry	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Industrial Park	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000
Manufacturing	0.00	0.00		0.00	0.0000	0.0000	0.00		0.00	0.00000	0.00000

Greenhouse Gas Emission Factors

	CO2	CH4	N2O	
Electricity	804.54	0.0067	0.0037	
Units	lbs CO2/mwh	lbs CH4/mwh	lbs N20/MWH	Source: Climate Action Registry General Reporting Protocol, Version 3.1, January, 2009.
Natural Gas	53.06	0.005	0.0001	
Units	CO2 (kg CO2/MMBtu)	CH4 (kg/MMBtu)	N2O(kg/MMBtu)	Source: Climate Action Registry General Reporting Protocol, Version 3.1, January, 2009.

Summary	Climate Zone 4 Summary		Climate Zone 5 Summary	
	Electric (kwh/sf)	Natural Gas (MM Btu/sf)	Electric (kwh/sf)	Natural Gas (MM Btu/sf)
All Commercial	13.64	0.02949	13.19	0.03169
Small Office (<30,000 sf)	17.37	0.00975	14.49	0.02999
Large Office (>= 30,000 sf)	23.51	0.02639	15.25	0.02328
Restaurant	35.97	0.21255	31.41	0.17108
Retail	12.82	0.00301	12.65	0.00551
Food Store	44.34	0.02577	40.26	0.04135
Refrigerated Warehouse	10.12	0.00388	24.86	0.01869
Unrefrigerated Warehouse	4.26	0.00440	4.56	0.00169
School	6.65	0.02271	5.51	0.01958
College	9.75	0.02754	12.70	0.04185
Health	23.03	0.11871	18.40	0.11073
Lodging	9.33	0.04695	10.03	0.03915
Miscellaneous	9.81	0.02965	8.98	0.02724
All Offices	21.35	0.02052	15.14	0.02426
All Warehouses	5.82	0.00426	7.71	0.00433

Residential Energy Use from California Statewide Residential Appliance Saturation Study, Tables 2-9, 2-13,2-15,2-4,2-5,2-23,2-24
See also Executive Summary for Natural Gas Use by Building Age

User Provided Blank Land Use Data: Project Data

Land Use Name	**Electricity Use/Year (MWH/Year)**	**Natural Gas Use/Year (MM Btu/Year)**	Electricity CO2 (metric tons/yr)	Electricity CH4 (metric tons/yr)	Electricity N2O (metric tons/yr)	Gas CO2 (metric tons/yr)	Gas CH4 (metric tons/yr)	Gas N2O (metric tons/yr)
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000

User Provided Blank Land Use Data: Baseline Data

Land Use Name	**Electricity Use/Year (MWH/Year)**	**Natural Gas Use/Year (MM Btu/Year)**	Electricity CO2 (metric tons/yr)	Electricity CH4 (metric tons/yr)	Electricity N2O (metric tons/yr)	Gas CO2 (metric tons/yr)	Gas CH4 (metric tons/yr)	Gas N2O (metric tons/yr)
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000
			0.00	0.00000	0.00000	0.00	0.00000	0.00000

Water and Wastewater

Baseline is currently: OFF

Unmitigated Water and Wastewater	Project	Baseline	Project-Baseline
CO2 metric tons/year:	152.0131	0.0000	
CH4 metric tons/year:	0.0013	0.0000	
N20 metric tons/year:	0.0007	0.0000	
CO2e metric tons/year:	152.2564	0.0000	
CO2e metric tons/year:			**152.26**

Mitigated Water and Wastewater	Project	Baseline	Project-Baseline
CO2 metric tons/year:	152.0131	0.0000	
CH4 metric tons/year:	0.0013	0.0000	
N20 metric tons/year:	0.0007	0.0000	
CO2e metric tons/year:	152.2564	0.0000	
CO2e metric tons/year:			**152.26**

Clear All User Overrides

***** Select Mitigation Measures on the Mitigation Tab ===>** Mitigation

	User Override of Model Estimates (af/yr)	Model Estimate (af/yr)	Total Gallons/year	Indoor Gallons/Year	Outdoor Gallons/year	Mitigated Indoor Gallons/Year	Mitigated Outdoor Gallons/year	Total Mitigated kwh/year
Baseline Water Demand		0.00	0	0.00	0.00	0.00	0.00	
Project Water Demand		271.80	88,578,347	55,682,181.72	32,896,165.50	55,682,181.72	32,896,165.50	
Net Increase in Water Demand		271.80	88,578,347	55,682,181.72	32,896,165.50	55,682,181.72	32,896,165.50	
						301296.29	115136.58	416,432.86

Houshold Size	
Single Family	Multi-family
2.94	2.65

Land Use Type	Square feet per employee	
1	Warehouse	1,700.00
2	Public Assembly	1,300.00
3	Lodging	1,300.00
4	Food Sales	1,000.00
5	Retail and Service	900.00
6	Education	766.00
7	Public Order and Safety	750.00
8	Food Service	600.00
9	Other	550.00
10	Health Care	500.00
11	Office	400.00

Energy Information Administration Special Topics 1995 Building Activities Other, Square feet per employee.
http://www.eia.doe.gov/emeu/consumptionbriefs/cbecs/pbawebsite/office/office_howmanyempl.htm

PROJECT	
% indoor water use	0.629
% outdoor water use	0.371
Total	1.00

BASELINE	
% indoor water use	0.000
% outdoor water use	0.000
Total	0.00

Project Water Demand - Indoor	301296.29	kwh/year
Project Water Demand - Outdoor	115136.58	kwh/year
Total	416432.86	kwh/year

Baseline Demand - Indoor	0.00	kwh/year
Baseline Demand - Outdoor	0.00	kwh/year
Total	0.00	kwh/year

Greenhouse Gas Emission Factors	CO2	CH4	N2O
Electricity	804.54	0.0067	0.0037
Units	#/mwh	#/mwh	#/mwh

from California Climate Action Registry, 2009

Table ES-1. Recommended revised water-energy proxies

	Indoor Uses		Outdoor Uses	
	Northern California kWh/MG	Southern California kWh/MG	Northern California kWh/MG	Southern California kWh/MG
Water Supply and Conveyance	2,117	9,727	2,117	9,727
Water Treatment	111	111	111	111
Water Distribution	1,272	1,272	1,272	1,272
Wastewater Treatment	1,911	1,911	0	0
Regional Total	5,411	13,022	3,500	11,111

from Navigant, 2006

Gallons Per Acre Foot:	325,900.00

Indoor vs. Outdoor Water Use			
	Indoor	Outdoor	Total
2001	0.64	0.36	1.00
2002	0.64	0.36	1.00
2003	0.64	0.36	1.00
2004	0.64	0.36	1.00
2005	0.64	0.36	1.00
2006	0.63	0.37	1.00
2007	0.63	0.37	1.00
2008	0.63	0.37	1.00
2009	0.63	0.37	1.00
2010	0.63	0.37	1.00
2011	0.63	0.37	1.00
2012	0.63	0.37	1.00
2013	0.63	0.37	1.00
2014	0.63	0.37	1.00
2015	0.63	0.37	1.00
2016	0.62	0.38	1.00
2017	0.62	0.38	1.00
2018	0.62	0.38	1.00
2019	0.62	0.38	1.00
2020	0.62	0.38	1.00
2021	0.62	0.38	1.00
2022	0.62	0.38	1.00
2023	0.62	0.38	1.00
2024	0.62	0.38	1.00
2025	0.62	0.38	1.00
2026	0.61	0.39	1.00
2027	0.61	0.39	1.00
2028	0.61	0.39	1.00
2029	0.61	0.39	1.00
2030	0.61	0.39	1.00

	Water Use		
Year	Single Family (gallons a day/ capita)	Multi-family (gallons a day/ capita)	Non-Res (gallons a day/ employee)
2001	108.00	75.00	86.00
2002	107.79	74.72	85.97
2003	107.59	74.45	85.93
2004	107.38	74.17	85.90
2005	107.17	73.90	85.86
2006	106.97	73.62	85.83
2007	106.76	73.34	85.79
2008	106.55	73.07	85.76
2009	106.34	72.79	85.72
2010	106.14	72.52	85.69
2011	105.93	72.24	85.66
2012	105.72	71.97	85.62
2013	105.52	71.69	85.59
2014	105.31	71.41	85.55

	From URBEMIS: Project Data		
	Land Use Residential	Units	Projected Water Use (gallons/yr)
	Single Family Residential	0.00	0.00
	Multi-family Residential	1,168.00	81,302,899.17
LU Type	Land Use Nonresidential	Square Feet	Projected Water Use (gallons/yr)
6	Day-Care Center	0.00	0.00
6	Elementary School	0.00	0.00
6	Junior High School	0.00	0.00
6	High School	0.00	0.00
6	Junior College	0.00	0.00
6	University/College	0.00	0.00
6	Library	0.00	0.00
9	Place of Worship	0.00	0.00
2	City Park	0.00	0.00
5	Racquet Club	0.00	0.00
5	Racquetball/Health	0.00	0.00
8	Quality Restaurant	0.00	0.00
8	High Turnover/Sit-Down Restaurant	0.00	0.00
8	Fast Food w/Drive Through	0.00	0.00
8	Fast Food w/o Drive Through	0.00	0.00
3	Hotel	0.00	0.00
3	Motel	0.00	0.00
5	Free-Standing Discount Store	0.00	0.00
5	Free-Standing Discount Superstore	0.00	0.00
5	Discount Club	0.00	0.00
5	Regional Shopping Center	50.53	1,754,601.01
5	Electronic Superstore	0.00	0.00
5	Home Improvement Superstore	0.00	0.00
5	Strip Mall	45.30	1,572,994.77
5	Hardware/Paint Store	0.00	0.00
4	Supermarket	0.00	0.00
4	Convenience Market	0.00	0.00
4	Convenience Market w/gas pumps	0.00	0.00
9	Gasoline Service Station	0.00	0.00
5	Bank w/Drive Through	0.00	0.00
11	General Office Building	34.36	2,684,508.29
11	Office Park	16.17	1,263,343.98
11	Government Office Building	0.00	0.00
11	Government Civic Center	0.00	0.00
5	Pharmacy w/Drive Through	0.00	0.00
5	Pharmacy w/o Drive Through	0.00	0.00
10	Medical Office Building	0.00	0.00
10	Hospital	0.00	0.00
1	Warehouse	0.00	0.00
1	General Light Industry	0.00	0.00
1	General Heavy Industry	0.00	0.00
1	Industrial Park	0.00	0.00
1	Manufacturing	0.00	0.00
			88,578,347.22

User Provided Blank Land Use Data: Project Data	
Land Use Name	**Projected Water Use (gallons/yr)**

2015	105.10	71.14	85.52
2016	104.90	70.86	85.48
2017	104.69	70.59	85.45
2018	104.48	70.31	85.41
2019	104.28	70.03	85.38
2020	104.07	69.76	85.34
2021	103.86	69.48	85.31
2022	103.66	69.21	85.28
2023	103.45	68.93	85.24
2024	103.24	68.66	85.21
2025	103.03	68.38	85.17
2026	102.83	68.10	85.14
2027	102.62	67.83	85.10
2028	102.41	67.55	85.07
2029	102.21	67.28	85.03
2030	102.00	67.00	85.00

Source:

San Francisco PUC Wholesale Customer Water Demand Projections Technical Report, Prepared by URS Corporation and Maddaeus Water Management, November 2004. Tables 3-2 and 5-2

	From URBEMIS: Baseline Data		
	Land Use Residential	Units	Projected Water use (gallons/yr)
	Single Family Residential	0.00	0.00
	Multi-family Residential	0.00	0.00
LU Type	Land Use Nonresidential	Square Feet	Projected Water use (gallons/yr)
6	Day-Care Center	0.00	0.00
6	Elementary School	0.00	0.00
6	Junior High School	0.00	0.00
6	High School	0.00	0.00
6	Junior College	0.00	0.00
6	University/College	0.00	0.00
6	Library	0.00	0.00
9	Place of Worship	0.00	0.00
2	City Park	0.00	0.00
5	Racquet Club	0.00	0.00
5	Racquetball/Health	0.00	0.00
8	Quality Restaurant	0.00	0.00
8	High Turnover/Sit-Down Restaurant	0.00	0.00
8	Fast Food w/Drive Through	0.00	0.00
8	Fast Food w/o Drive Through	0.00	0.00
3	Hotel	0.00	0.00
3	Motel	0.00	0.00
5	Free-Standing Discount Store	0.00	0.00
5	Free-Standing Discount Superstore	0.00	0.00
5	Discount Club	0.00	0.00
5	Regional Shopping Center	0.00	0.00
5	Electronic Superstore	0.00	0.00
5	Home Improvement Superstore	0.00	0.00
5	Strip Mall	0.00	0.00
5	Hardware/Paint Store	0.00	0.00
4	Supermarket	0.00	0.00
4	Convenience Market	0.00	0.00
4	Convenience Market w/gas pumps	0.00	0.00
9	Gasoline Service Station	0.00	0.00
5	Bank w/Drive Through	0.00	0.00
11	General Office Building	0.00	0.00
11	Office Park	0.00	0.00
11	Government Office Building	0.00	0.00
11	Government Civic Center	0.00	0.00
5	Pharmacy w/Drive Through	0.00	0.00
5	Pharmacy w/o Drive Through	0.00	0.00
10	Medical Office Building	0.00	0.00
10	Hospital	0.00	0.00
1	Warehouse	0.00	0.00
1	General Light Industry	0.00	0.00
1	General Heavy Industry	0.00	0.00
1	Industrial Park	0.00	0.00
1	Manufacturing	0.00	0.00
			0.00

User Provided Blank Land Use Data: Baseline Data	
Land Use Name	**Projected Water Use (gallons/yr)**

Solid Waste

Baseline is currently: OFF

	Unmitigated Solid Waste		
	Project	Baseline	Project - Baseline
Truck Haul CO2 (metric tons/year):	10.61	0.00	
Truck Haul CH4 (metric tons/year):	0.0002	0.0000	
Truck Haul CO2e (metric tons/year):	10.62	0.00	
Landfill Offgasing (CO2e metric tons/year):	1,440.99	0.00	
Total Solid Waste (CO2e metric tons/year):	1,451.61	0.00	
Total Solid Waste (CO2e metric tons/year):			**1,451.61**

	Mitigated Solid Waste		
	Project	Baseline	Project - Baseline
Truck Haul CO2 (metric tons/year):	10.61	0.00	
Truck Haul CH4 (metric tons/year):	0.0002	0.0000	
Truck Haul CO2e (metric tons/year):	10.62	0.00	
Landfill Offgasing (CO2e metric tons/year):	1,440.99	0.00	
Total Solid Waste (CO2e metric tons/year):	1,451.61	0.00	
Total Solid Waste (CO2e metric tons/year):			**1,451.61**

***** Select Mitigation Measures on the Mitigation Tab ===>** Mitigation

Project Landfill disposal option:

Select 1 of 3 options
- ○ Landfilling only
- ◉ Landfilling with Flaring to Burn Methane
- ○ Landfilling with Energy Recovery

Baseline Landfill disposal option:

Select 1 of 3 options
- ○ Landfilling only
- ◉ Landfilling with Flaring to Burn Methane
- ○ Landfilling with Energy Recovery

Clear All User Overrides

Project	Defaults	User Override
Average Round Trip Truck Haul Distance (miles):	40.00	
Solid Waste Truck Capacity (tons):	15.00	
Round Trips/Year:	150.10	
Miles per Year:	6,004.13	

Baseline	Defaults	User Override
Avg Round Trip Truck Haul Distance (miles):	40.00	
Solid Waste Truck Capacity (tons):	15.00	
Round Trips/Year:	0.00	
Miles per Year:	0.00	

PROJECT Residential Land Use (From URBEMIS)	Units	Estimated Solid Waste Generation Rate (tons/residence/yr)	Estimated Solid Waste Generation/Year (tons)	User Override of Solid Waste Generated/Year (tons)	CO2e (metric tons/year)	Solid Waste Generated/Year (tons)
Single Family Residential	0.00	2.23	0.00		0.00	0.00
Multi-Family Residential	1,168.00	1.17	1,366.56		874.60	1,366.56
PROJECT Nonresidential Land Use (From URBEMIS)	Square Footage (1,000) from URBEMIS	Estimated Solid Waste Generation Rate (tons/sf/yr)	Estimated Solid Waste Generation/Year (tons)	User Override of Solid Waste Generated/Year (tons)	CO2 (metric tons/yr)	
Day-Care Center	0.00	0.0013	0.00		0.00	0.00
Elementary School	0.00	0.0013	0.00		0.00	0.00
Junior High School	0.00	0.0013	0.00		0.00	0.00
High School	0.00	0.0013	0.00		0.00	0.00
Junior College	0.00	0.0013	0.00		0.00	0.00
University/College	0.00	0.0013	0.00		0.00	0.00
Library	0.00	0.0013	0.00		0.00	0.00
Place of Worship	0.00	0.0013	0.00		0.00	0.00
City Park	0.00	0.0000	0.00		0.00	0.00
Racquet Club	0.00	0.0057	0.00		0.00	0.00
Racquetball/Health	0.00	0.0057	0.00		0.00	0.00
Quality Restaurant	0.00	0.0009	0.00		0.00	0.00
High Turnover/Sit-Down Restaurant	0.00	0.0009	0.00		0.00	0.00
Fast Food w/Drive Through	0.00	0.0009	0.00		0.00	0.00
Fast Food w/o Drive Through	0.00	0.0009	0.00		0.00	0.00
Hotel	0.00	0.0108	0.00		0.00	0.00
Motel	0.00	0.0108	0.00		0.00	0.00
Free-Standing Discount Store	0.00	0.0046	0.00		0.00	0.00
Free-Standing Discount Superstore	0.00	0.0046	0.00		0.00	0.00
Discount Club	0.00	0.0046	0.00		0.00	0.00
Regional Shopping Center	50.53	0.0046	230.54		147.55	230.54
Electronic Superstore	0.00	0.0046	0.00		0.00	0.00
Home Improvement Superstore	0.00	0.0046	0.00		0.00	0.00
Strip Mall	45.30	0.0024	108.72		69.58	108.72
Hardware/Paint Store	0.00	0.0024	0.00		0.00	0.00
Supermarket	0.00	0.0057	0.00		0.00	0.00
Convenience Market	0.00	0.0024	0.00		0.00	0.00
Convenience Market w/gas pumps	0.00	0.0024	0.00		0.00	0.00
Gasoline Service Station	0.00	0.0024	0.00		0.00	0.00
Bank w/Drive Through	0.00	0.0108	0.00		0.00	0.00
General Office Building	34.36	0.0108	371.09		237.50	371.09
Office Park	16.17	0.0108	174.64		111.77	174.64
Government Office Building	0.00	0.0108	0.00		0.00	0.00
Government Civic Center	0.00	0.0108	0.00		0.00	0.00
Pharmacy w/Drive Through	0.00	0.0024	0.00		0.00	0.00
Pharmacy w/o Drive Through	0.00	0.0024	0.00		0.00	0.00
Medical Office Building	0.00	0.0108	0.00		0.00	0.00
Hospital	0.00	0.0108	0.00		0.00	0.00
Warehouse	0.00	0.0026	0.00		0.00	0.00
General Light Industry	0.00	0.0011	0.00		0.00	0.00
General Heavy Industry	0.00	0.0011	0.00		0.00	0.00
Industrial Park	0.00	0.0011	0.00		0.00	0.00
Manufacturing	0.00	0.0026	0.00		0.00	0.00
			2,251.55		1,440.99	2,251.55

User Provided Blank Land Use Data: Project Data

Land Use Name	**Solid Waste Generation/Year (tons)**	**CO2e (metric tons/year)**
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
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		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00

BASELINE Residential Land Use (From URBEMIS)	Units	Estimated Solid Waste Generation Rate (tons/residence/yr)	Estimated Solid Waste Generation/Year (tons)	User Override of Solid Waste Generated/Year (tons)	CO2e (metric tons/year)	Solid Waste Generated/Year (tons)
Single Family Residential	0.00	2.23	0.00		0.00	0.00
Multi-Family Residential	0.00	1.17	0.00		0.00	0.00
BASELINE Nonresidential Land Use (From URBEMIS)	Square Footage (1,000) from URBEMIS	Estimated Solid Waste Generation Rate (tons/sf/yr)	Estimated Solid Waste Generation/Year (tons)	User Override of Solid Waste Generated/Year (tons)	CO2 (metric tons/yr)	
Day-Care Center	0.00	0.0013	0.00		0.00	0.00
Elementary School	0.00	0.0013	0.00		0.00	0.00
Junior High School	0.00	0.0013	0.00		0.00	0.00
High School	0.00	0.0013	0.00		0.00	0.00
Junior College	0.00	0.0013	0.00		0.00	0.00
University/College	0.00	0.0013	0.00		0.00	0.00
Library	0.00	0.0013	0.00		0.00	0.00
Place of Worship	0.00	0.0013	0.00		0.00	0.00
City Park	0.00	0.0000	0.00		0.00	0.00
Racquet Club	0.00	0.0057	0.00		0.00	0.00
Racquetball/Health	0.00	0.0057	0.00		0.00	0.00
Quality Restaurant	0.00	0.0009	0.00		0.00	0.00
High Turnover/Sit-Down Restaurant	0.00	0.0009	0.00		0.00	0.00
Fast Food w/Drive Through	0.00	0.0009	0.00		0.00	0.00
Fast Food w/o Drive Through	0.00	0.0009	0.00		0.00	0.00
Hotel	0.00	0.0108	0.00		0.00	0.00
Motel	0.00	0.0108	0.00		0.00	0.00
Free-Standing Discount Store	0.00	0.0046	0.00		0.00	0.00
Free-Standing Discount Superstore	0.00	0.0046	0.00		0.00	0.00
Discount Club	0.00	0.0046	0.00		0.00	0.00
Regional Shopping Center	0.00	0.0046	0.00		0.00	0.00
Electronic Superstore	0.00	0.0046	0.00		0.00	0.00
Home Improvement Superstore	0.00	0.0046	0.00		0.00	0.00
Strip Mall	0.00	0.0024	0.00		0.00	0.00
Hardware/Paint Store	0.00	0.0024	0.00		0.00	0.00
Supermarket	0.00	0.0057	0.00		0.00	0.00
Convenience Market	0.00	0.0024	0.00		0.00	0.00
Convenience Market w/gas pumps	0.00	0.0024	0.00		0.00	0.00
Gasoline Service Station	0.00	0.0024	0.00		0.00	0.00
Bank w/Drive Through	0.00	0.0108	0.00		0.00	0.00
General Office Building	0.00	0.0108	0.00		0.00	0.00
Office Park	0.00	0.0108	0.00		0.00	0.00
Government Office Building	0.00	0.0108	0.00		0.00	0.00
Government Civic Center	0.00	0.0108	0.00		0.00	0.00
Pharmacy w/Drive Through	0.00	0.0024	0.00		0.00	0.00
Pharmacy w/o Drive Through	0.00	0.0024	0.00		0.00	0.00
Medical Office Building	0.00	0.0108	0.00		0.00	0.00
Hospital	0.00	0.0108	0.00		0.00	0.00
Warehouse	0.00	0.0026	0.00		0.00	0.00
General Light Industry	0.00	0.0011	0.00		0.00	0.00
General Heavy Industry	0.00	0.0011	0.00		0.00	0.00
Industrial Park	0.00	0.0011	0.00		0.00	0.00
Manufacturing	0.00	0.0026	0.00		0.00	0.00
					0.00	0.00

User Provided Blank Land Use Data: Baseline Data

Land Use Name	Solid Waste Generation/Year (tons)	CO2e (metric tons/year)
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
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		0.00
		0.00
		0.00
		0.00
		0.00
		0.00

WARM Emission Factors			
	Landfilling, No Recovery	Landfilling w/Flaring	Landfilling w/Energy Recovery
Mixed Solid Waste	3.10	0.64	0.30
Emissions (from EMFAC2007, 35 mph for Heavy-Heavy Duty Trucks			
Year	CO2 (grams/mile)	CH4 (grams/mile)	
2005	1,723.50	0.06	
2006	1,733.00	0.06	
2007	1,740.80	0.06	
2008	1,748.40	0.05	
2009	1,755.80	0.05	
2010	1,763.00	0.05	
2011	1,769.30	0.04	
2012	1,775.00	0.04	
2013	1,780.40	0.04	
2014	1,785.10	0.03	
2015	1,789.20	0.03	
2016	1,792.90	0.03	
2017	1,796.20	0.03	
2018	1,799.00	0.02	
2019	1,801.60	0.02	
2020	1,803.60	0.02	
2025	1,809.70	0.02	
2030	1,812.10	0.01	
2035	1,813.40	0.01	
2040	1,813.80	0.01	

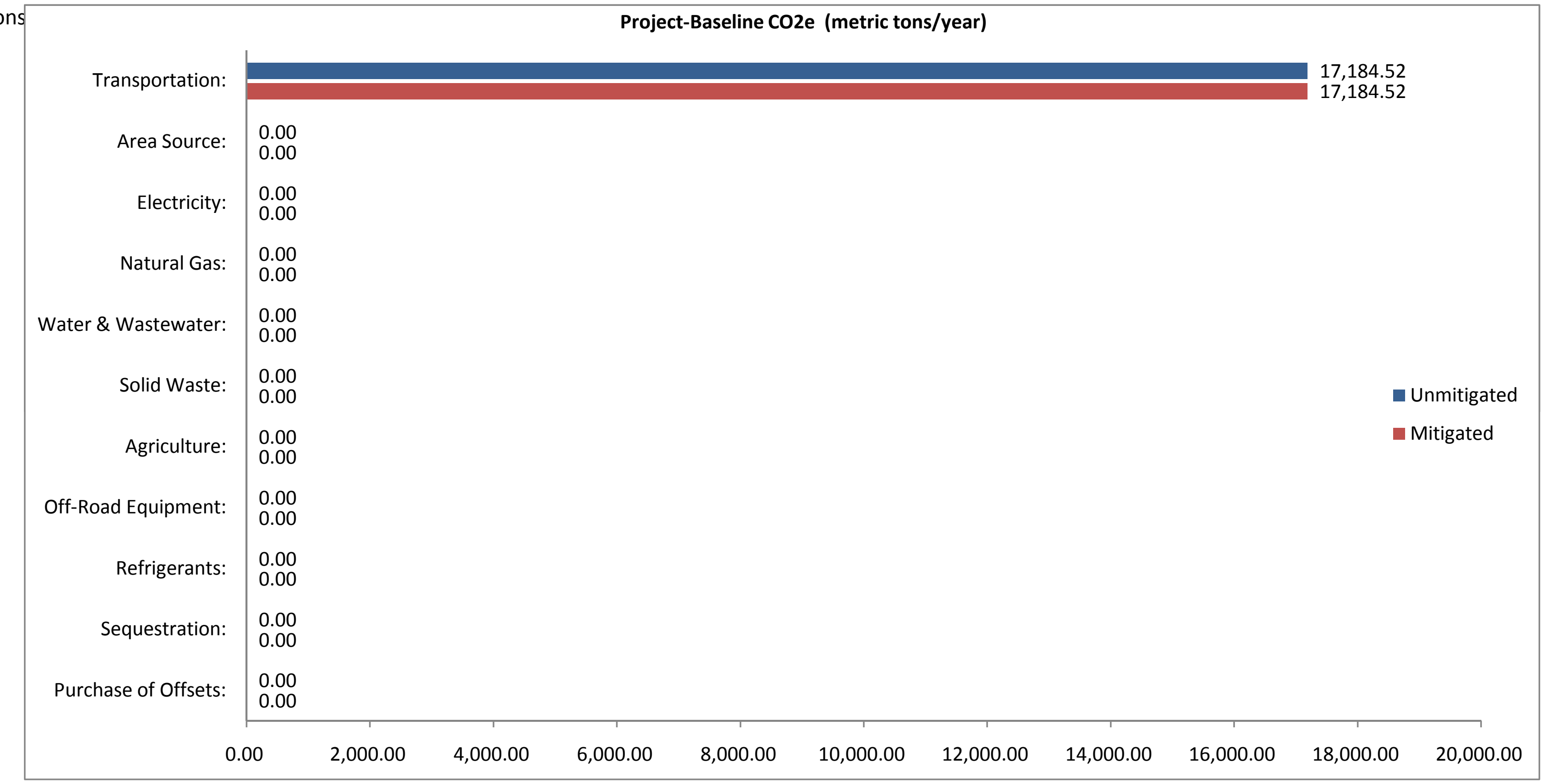
Low Carbon Fuels Standards		
Year	% Reduction Gasoline and Diesel Fuel	% Reduction Tank to Wheels
2010	0.00	0.00
2011	0.25	0.18
2012	0.50	0.36
2013	1.00	0.72
2014	1.50	1.08
2015	2.50	1.80
2016	3.50	2.52
2017	5.00	3.60
2018	6.50	4.68
2019	8.00	5.76
2020	10.00	7.20
2021	10.00	7.20
2022	10.00	7.20
2023	10.00	7.20
2024	10.00	7.20
2025	10.00	7.20
2026	10.00	7.20
2027	10.00	7.20
2028	10.00	7.20
2029	10.00	7.20
2030	10.00	7.20
2031	10.00	7.20
2032	10.00	7.20
2033	10.00	7.20
2034	10.00	7.20
2035	10.00	7.20
2036	10.00	7.20
2037	10.00	7.20
2038	10.00	7.20
2039	10.00	7.20
2040	10.00	7.20

Source:
Final Regulation Order
Subchapter 10. Climate Change
Article 4. Regulations to Achieve Greenhouse Gas Reductions
Subarticle 7. Low Carbon Fuel Standard
Section 95482. Average Carbon Intensity Requirements for Gasoline and Diesel

Summary Results

Project Name: Pittsburg - Bay Point BART Master Plan - Operational Emissions
Project and Baseline Years: 2012 N/A

Results	Unmitigated Project-Baseline CO2e (metric tons/year)	Mitigated Project-Baseline CO2e (metric tons/year)
Transportation:	17,184.52	17,184.52
Area Source:	0.00	0.00
Electricity:	0.00	0.00
Natural Gas:	0.00	0.00
Water & Wastewater:	0.00	0.00
Solid Waste:	0.00	0.00
Agriculture:	0.00	0.00
Off-Road Equipment:	0.00	0.00
Refrigerants:	0.00	0.00
Sequestration:	N/A	0.00
Purchase of Offsets:	N/A	0.00
Total:	17,184.52	17,184.52



Baseline is currently: **OFF**
Baseline Project Name:
Go to Settings Tab to Turn On Baseline

Detailed Results

Unmitigated	CO2 (metric tpy)	CH4 (metric tpy)	N2O (metric tpy)	CO2e (metric tpy)	% of Total
Transportation*:				17,184.52	100.00%
Area Source:	0.00	0.00	0.00	0.00	0.00%
Electricity:	0.00	0.00	0.00	0.00	0.00%
Natural Gas:	0.00	0.00	0.00	0.00	0.00%
Water & Wastewater:	0.00	0.00	0.00	0.00	0.00%
Solid Waste:	0.00	0.00	N/A	0.00	0.00%
Agriculture:	0.00	0.00	0.00	0.00	0.00%
Off-Road Equipment:	0.00	0.00	0.00	0.00	0.00%
Refrigerants:	N/A	N/A	N/A	0.00	0.00%
Sequestration:	N/A	N/A	N/A	N/A	N/A
Purchase of Offsets:	N/A	N/A	N/A	N/A	N/A
Total:				17,184.52	100.00%

Baseline	CO2 (metric tpy)	CH4 (metric tpy)	N2O (metric tpy)	CO2e (metric tpy)	% of Total
Transportation*:				0.00	N/A
Area Source:	0.00	0.00	0.00	0.00	N/A
Electricity:	0.00	0.00	0.00	0.00	N/A
Natural Gas:	0.00	0.00	0.00	0.00	N/A
Water & Wastewater:	0.00	0.00	0.00	0.00	N/A
Solid Waste:	0.00	0.00	N/A	0.00	N/A
Agriculture:	0.00	0.00	0.00	0.00	N/A
Off-Road Equipment:	0.00	0.00	0.00	0.00	N/A
Refrigerants:	N/A	N/A	N/A	0.00	N/A
Sequestration:	N/A	N/A	N/A	N/A	N/A
Purchase of Offsets:	N/A	N/A	N/A	N/A	N/A
Total:				0.00	0.00%

* Several adjustments were made to transportation emissions after they have been imported from URBEMIS.
After importing from URBEMIS, CO2 emissions are converted to metric tons and then adjusted to account for the "Pavley"
regulation. Then, CO2 is converted to CO2e by multiplying by 100/95 to account for the contribution of other GHGs (CH4, N2O, and HFCs [from leaking air conditioners]).
Finally, CO2e is adjusted to account for th low carbon fuels rule.

Mitigated	CO2 (metric tpy)	CH4 (metric tpy)	N2O (metric tpy)	CO2e (metric tpy)	% of Total
Transportation*:				17,184.52	100.00%
Area Source:	0.00	0.00	0.00	0.00	0.00%
Electricity:	0.00	0.00	0.00	0.00	0.00%
Natural Gas:	0.00	0.00	0.00	0.00	0.00%
Water & Wastewater:	0.00	0.00	0.00	0.00	0.00%
Solid Waste:	0.00	0.00	N/A	0.00	0.00%
Agriculture:	0.00	0.00	0.00	0.00	0.00%
Off-Road Equipment:	0.00	0.00	0.00	0.00	0.00%
Refrigerants:	N/A	N/A	N/A	0.00	0.00%
Sequestration:	N/A	N/A	N/A	0.00	0.00%
Purchase of Offsets:	N/A	N/A	N/A	0.00	0.00%
Total:				17,184.52	100.00%

Mitigation Measures Selected:

Transportation: Go to the following tab: Transp. Detail Mit for a list of the transportation mitigation measures selected (in URBEMIS)

Electricity: The following mitigation measure(s) have been selected to reduce electricity emissions.

Natural Gas: The following mitigation measure(s) have been selected to reduce natural gas emissions.

Water and Wastewater: The following mitigation measure(s) have been selected to reduce water and wastewater emissions.

Solid Waste: The following mitigation measure has been selected to reduce solid waste related GHG emissions.

Ag: No existing mitigation measures available.

Off-Road Equipment: No existing mitigation measures available.

Refrigerants: The following mitigation measure has ben selected to reduce refrigerant emissions:

Carbon Sequestration: Project does not include carbon sequestration through tree planting.

Emission Offsets/Credits: Project does not include purchase of emission offsets/credits.

Transportation

Baseline is Currently: OFF

Unmitigated Transportation

Target Year:	2012	2011	
	Project	Baseline	Project-Baseline
Operational Emissions from URBEMIS (CO2 tons/year)	18,585.06	0.00	
Metric Ton Adjustment (CO2 metric tons/year)	16,864.85	0.00	
Pavley Regulation Adjustment (CO2 metric tons/year):	16,384.27	0.00	
US EPA Adjustment (CO2e metric tons/year):	17,246.60	0.00	
Low Carbon Fuels Rule Adjustment (CO2e metric tons/year)	17,184.52	0.00	
Total (CO2e metric tons/year):			**17,184.52**

Mitigated Transportation

Target Year:	2012	2011	
	Project	Baseline	Project-Baseline
Operational Vehicles from URBEMIS (CO2 tons/year):	18,585.06	0.00	
Metric Ton Adjustment (CO2 metric tons/year):	16,864.85	0.00	
Pavley Regulation Adjustment (CO2 metric tons/year):	16,384.27	0.00	
US EPA Adjustment (CO2e metric tons/year):	17,246.60	0.00	
Low Carbon Fuels Adjustment (CO2e metric tons/year):	17,184.52	0.00	
Total (CO2e metric tons/year):			**17,184.52**

The BGM User's Manual describes in detail each step used to convert URBEMIS's transportation CO2 emissions to total CO2e.
These steps include converting from English to Metric units, adjusting for the Pavley Rule, converting CO2 to CO2e, and adjusting for the Low Carbon Fuels Rule.

Reference

U.S. EPA assumption that GHG emissions from other pollutants - CH4, N20, and hydrofluorcarbons (HFCs) from leaking air conditioners account for 5 percent of emissions from vehicles, after accounting for global warming potentail of each GHG.

Jump to the Following Transportation Related Tabs:
Transportation Detail for Operational Mitigation
Land Use Detail

	Don't Need to Adjust this amt	Unadjusted Amount Affected by Pavley	Adjusted	Adusted	Adusted	Adusted	Adjusted
	Not Affected by Pavley	LDA/ LDT1/ LDT2/ MDV	LDA	LDT1	LDT2	MDV	4 totaled
Pavley Calculations - Project Unmitigated	2,821.74	14,043.11	6,777.38	2,039.85	3,199.02	1,546.28	13,562.54
Pavley Calculations - Baseline Unmitigated	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pavley Calculations - Project Mitigated	2,821.74	14,043.11	6,777.38	2,039.85	3,199.02	1,546.28	13,562.54
Pavley Calculations - Baseline Mitigated	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Pavley Adjustment

											12.00	13.00	14.00	15.00	16.00
Year	% LDA CO2 Emissions	% LDT1 CO2 Emissions	% LDT2 CO2 Emissions	% MDV CO2 Emissions	% LDA/LDT1/LDT2/MDV	% everything else	% CO2 Reduction - LDA	% CO2 Reduction - LDT1	% CO2 Reduction - LDT2	% CO2 Reduction MDV	LDA				
2009	41.59%	12.33%	19.61%	9.71%	83.26%	16.74%	0.00%	0.00%	0.07%	0.08%	0.0000	0.0000	0.0006	0.0007	0.0013
2010	41.72%	12.39%	19.54%	9.61%	83.26%	16.74%	0.35%	0.25%	0.45%	0.48%	0.0020	0.0022	0.0036	0.0044	0.0122
2011	41.83%	12.45%	19.50%	9.50%	83.27%	16.73%	1.75%	1.34%	1.31%	1.29%	0.0102	0.0117	0.0106	0.0117	0.0442
2012	41.89%	12.50%	19.47%	9.40%	83.27%	16.73%	4.07%	3.27%	2.60%	2.44%	0.0237	0.0286	0.0209	0.0221	0.0953
2013	41.94%	12.56%	19.46%	9.32%	83.28%	16.72%	6.31%	5.26%	3.88%	3.61%	0.0366	0.0460	0.0313	0.0328	0.1466
2014	41.98%	12.62%	19.46%	9.27%	83.33%	16.67%	8.48%	7.26%	5.17%	4.83%	0.0492	0.0634	0.0416	0.0438	0.1980
2015	42.00%	12.67%	19.47%	9.24%	83.38%	16.62%	10.74%	9.38%	6.54%	6.17%	0.0623	0.0819	0.0527	0.0560	0.2529
2016	42.05%	12.76%	19.50%	9.23%	83.54%	16.46%	12.96%	11.56%	7.94%	7.54%	0.0751	0.1008	0.0639	0.0684	0.3082
2017	42.02%	12.81%	19.51%	9.21%	83.55%	16.45%	15.03%	13.58%	9.27%	8.88%	0.0871	0.1184	0.0746	0.0806	0.3608
2018	41.98%	12.84%	19.52%	9.21%	83.55%	16.45%	16.94%	15.43%	10.54%	10.16%	0.0983	0.1345	0.0848	0.0923	0.4099
2019	41.95%	12.87%	19.53%	9.21%	83.57%	16.43%	18.72%	17.13%	11.74%	11.40%	0.1087	0.1492	0.0945	0.1035	0.4559
2020	41.92%	12.89%	19.55%	9.22%	83.59%	16.41%	20.37%	18.69%	12.89%	12.59%	0.1183	0.1628	0.1037	0.1143	0.4990
2025	41.92%	12.96%	19.67%	9.28%	83.82%	16.18%	26.87%	24.86%	17.60%	17.42%	0.1560	0.2164	0.1414	0.1581	0.6719
2030	42.15%	13.03%	19.76%	9.32%	84.26%	15.74%	30.60%	28.71%	20.63%	20.47%	0.1770	0.2497	0.1655	0.1856	0.7779
2035	42.21%	13.11%	19.80%	9.35%	84.47%	15.53%	32.38%	31.17%	22.43%	22.29%	0.1871	0.2708	0.1799	0.2021	0.8400
2040	42.24%	13.14%	19.90%	9.44%	84.72%	15.28%	33.27%	32.61%	23.60%	23.53%	0.1922	0.2832	0.1890	0.2131	0.8775

Step 1 - Figure out year
Step 2- Emissions from HDVs, etc. do not change
Step 3 - Adjust emissions from LDA's, etc. individually
Step 4 - Add Step 2 and Step 3 emissions

Low Carbon Fuels Standards

Year	% Reduction Gasoline and Diesel Fuel	% Reduction Tank to Wheels
2010	0.00	0.00
2011	0.25	0.18
2012	0.50	0.36
2013	1.00	0.72
2014	1.50	1.08
2015	2.50	1.80
2016	3.50	2.52
2017	5.00	3.60
2018	6.50	4.68
2019	8.00	5.76
2020	10.00	7.20
2021	10.00	7.20
2022	10.00	7.20
2023	10.00	7.20
2024	10.00	7.20
2025	10.00	7.20
2026	10.00	7.20
2027	10.00	7.20
2028	10.00	7.20
2029	10.00	7.20
2030	10.00	7.20
2031	10.00	7.20
2032	10.00	7.20
2033	10.00	7.20
2034	10.00	7.20
2035	10.00	7.20
2036	10.00	7.20
2037	10.00	7.20
2038	10.00	7.20
2039	10.00	7.20
2040	10.00	7.20

Source:
Final Regulation Order
Subchapter 10. Climate Change
Article 4. Regulations to Achieve Greenhouse Gas Reductions
Subarticle 7. Low Carbon Fuel Standard
Section 95482. Average Carbon Intensity Requirements for Gasoline and Diesel

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

Project Name: Pittsburg - Bay Point BART Master Plan - Area Source Emissions - Build-out

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	CO_2
TOTALS (tons/year, unmitigated)	2,947.61

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	CO_2
TOTALS (tons/year, unmitigated)	2,947.61

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	CO2
Natural Gas	2,328.87
Hearth	617.22
Landscape	1.52
Consumer Products	
Architectural Coatings	
TOTALS (tons/year, unmitigated)	2,947.61

Area Source Changes to Defaults

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

Project Name: Pittsburg - Bay Point BART Master Plan - Operational Emissions - Build-out

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	CO_2
TOTALS (tons/year, unmitigated)	18,585.06

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	CO_2
TOTALS (tons/year, unmitigated)	18,585.06

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Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	CO_2
Trips	18,585.06
TOTALS (tons/year, unmitigated)	18,585.06

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2012 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Trips		1,000.00	unknown	39.63	39,630.00	107,001.00
					39,630.00	107,001.00

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	53.8	0.7	99.1	0.2
Light Truck < 3750 lbs	12.8	1.6	95.3	3.1
Light Truck 3751-5750 lbs	19.8	0.5	99.5	0.0
Med Truck 5751-8500 lbs	6.6	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.9	0.0	77.8	22.2
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.4	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.2	59.4	40.6	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	0.6	0.0	83.3	16.7

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	2.7	2.7	2.7	2.7	2.7	2.7
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Trips				2.0	1.0	97.0