ATTACHMENT 3

Initial Study / Mitigated Negative Declaration, Vernola Marketplace Apartments, Master Application 1485 (January 29, 2015) (including Traffic Impact Analysis)

Initial Study/ Mitigated Negative Declaration

VERNOLA MARKETPLACE APARTMENTS

MASTER APPLICATION 1485

CITY OF JURUPA VALLEY
8304 Limonite Avenue
Suite M
Jurupa Valley, California 92509
www.jurupavalley.org

January 29, 2015

Initial Study/
Mitigated Negative Declaration

Vernola Marketplace Apartments

City of Jurupa Valley Master Application 1485:

General Plan Amendment 1404
Zone Change 1405
Specific Plan Amendment 1401
Site Development Permit 31416
Development Agreement DA1501

Prepared for:

City of Jurupa Valley
8304 Limonite Avenue Suite "M"
Jurupa Valley, CA 92509
Contact: Laurie Lovret

Applicant:
Rick Bondar
P.O. Box 1295
Corona, CA 92878

CEQA Consultant:
T&B Planning, Inc.
17542 East 17th Street, Suite 100
Tustin, CA 92780

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1.0 Introduction

1.0 INTRODUCTION

1.1 Document Purpose

This document is an Initial Study/Mitigated Negative Declaration (IS/MND) prepared in accordance with the California Environmental Quality Act (CEQA), including all criteria, standards, and procedures of CEQA (California Public Resource Code Section 21000 et seq.) and the CEQA Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3, Section 15000 et seq.). This IS/MND is an informational document intended for use by the City of Jurupa Valley, Trustee and Responsible agencies, and members of the general public in evaluating the physical environmental effects of the proposed Vernola Marketplace Apartments Project (hereafter "the Project" and as further described in Subsection 5.3).

This IS/MND was compiled by the City of Jurupa Valley Planning Department, serving as the Lead Agency for the proposed Project pursuant to CEQA §21067 and CEQA Guidelines Article 4 and §15367. "Lead Agency" refers to the public agency that has the principal responsibility for carrying out or approving a project.

The following information is provided in this Introduction: 1) the location of the proposed Project; 2) the standards of adequacy for a MND under CEQA; 3) a summary of the Initial Study findings supporting the Lead Agency's decision to prepare a MND for the proposed Project; 4) a description of the format and content of this IS/MND; 5) the governmental processing requirements to consider the proposed Project for approval; and 6) a description of the proposed Project.

1.2 Project Location

The Project site is approximately 17.4 acres in size and is located in the City of Jurupa Valley, Riverside County, California. Specifically, the property is located east of Interstate 15 (I-15), north of 68th Street, and west of Pats Ranch Road. Additional Project location details, including a regional and vicinity map are provided in Section 5.1 Environmental Setting of this document.

1.3 Project Summary

The Project Applicant submitted the following applications to the City of Jurupa Valley, which comprise the proposed Project: a General Plan Amendment (GPA1404), Change of Zone (CZ1405), Specific Plan Amendment No. 3 to the I-15 Corridor Specific Plan (SPA1401), Development Agreement (DA1501), and a Site Development Plan (SDP31416). Collectively, the City of Jurupa Valley refers to these applications as Master Application No. MA1485. The Project Applicant's marketing name for the Project is "Vernola Marketplace Apartments." GPA1404 seeks to change the General Plan land use designation of the property from Community Development: Light Industrial (LI) to Community Development: Highest Density Residential (HHDR). CZ1405 seeks to change the zoning classification from Industrial Park (IP) to General Residential (R-3). The proposed Project site comprises a portion of Planning Area 5 of Specific Plan No. 266 (I-15 Corridor Specific Plan). Specific Plan No. 266 Amendment No. 3 proposes to revise the boundary of Planning Area 5 to remove a portion of the planning area, including a portion of the Project site, from the

Specific Plan. DA15101 is the case number for a proposed Development Agreement between the Applicant and the City of Jurupa Valley, to specify and guarantee the land use rights to be granted for this project as well as the Project commitments to provide infrastructure improvements, funding for various community improvements, development phasing, and other conditions. SPA1401 is the City of Jurupa Valley case number that identifies said Specific Plan Amendment proposal. Site Development Permit (SDP31416) proposes 25 apartment buildings housing a total of 397 apartment units.

Refer to Subsection 5.3, *Project Description*, for a more detailed description of the proposed Project. The Project's application materials are on file with the City of Jurupa Valley Planning Department (8304 Limonite Avenue, Suite "M," Jurupa Valley, California 92509) and are hereby incorporated by reference. CEQA Guidelines §15150 allows for the incorporation "by reference all or portions of another document… [and is] most appropriate for including long, descriptive, or technical materials that provide general background …."

1.4 California Environmental Quality Act (CEQA)

1.4.1 CEQA Objectives

CEQA (Public Resources Code §21000, et seq.) requires that before a public agency makes a decision to approve a project that could have one or more adverse effects on the physical environment, the agency must inform itself about the project's potential environmental impacts, give the public an opportunity to comment on the environmental issues, and take feasible measures to avoid or reduce potential harm to the physical environment. The principal objectives of CEQA are to: 1) inform governmental decision makers and the public about the potential, significant environmental effects of proposed activities; 2) identify the ways that environmental damage can be avoided or significantly reduced; 3) prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible; and 4) disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

1.4.2 CEQA Requirements for MNDs

A MND is a written statement by the Lead Agency briefly describing the reasons a proposed project, which is not exempt from the requirements of CEQA, will not have a significant effect on the environment and therefore does not require the preparation of an Environmental Impact Report (EIR) (CEQA Guidelines § 15371). The CEQA Guidelines require the preparation of a MND if the Initial Study prepared for a project identifies potentially significant effects, but: 1) revisions in the project plans or proposals made by, or agreed to by the applicant before a proposed MND and Initial Study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur; and 2) there is no substantial evidence, in light of the whole record before the Lead Agency, that the project as revised may have a significant effect on the environment. If the potentially significant effects associated with a project cannot be mitigated to a level below significance, then an EIR must be prepared (CEQA Guidelines § 15070[b]).

1.4.3 CEQA Requirements for Environmental Setting and Baseline Conditions

CEQA Guidelines §15125 establishes requirements for defining the environmental setting to which the environmental effects of a proposed project must be compared. The environmental setting is defined as "…the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time the environmental analysis is commenced…" (CEQA Guidelines §15125[a]). In the case of the proposed Project, the Initial Study determined that a MND is the appropriate form of CEQA compliance document, which does not require a Notice of Preparation (NOP). Thus, the environmental setting for the proposed Project is the approximate date that the Project's environmental analysis commenced.

The Project Applicant submitted applications for the proposed Project to the City of Jurupa Valley in July 2014, at which time the City commenced the Project's environmental analysis. Accordingly, the environmental setting for the proposed Project is defined as the physical environmental conditions on the Project site and in the vicinity of the proposed Project as they existed in July 2014.

1.4.4 Initial Study Findings

Section 6.0 of this document contains the responses to the Environmental Checklist/Initial Study that was prepared for the proposed Project pursuant to CEQA and City of Jurupa Valley requirements. The Environmental Checklist/Initial Study determined that implementation of the proposed Project would result in no impacts or less than significant environmental effects under the issue areas of:

- Agriculture and Forestry Resources
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Population and Housing
- Public Services
- Recreation
- Utilities
- Mandatory Findings of Significance

The Environmental Checklist/Initial Study determined that the proposed Project would result in potentially significant effects to the following issue areas, but the Project Applicant will incorporate mitigation measures that would avoid or mitigate effects to a point where clearly no significant environmental effects would occur:

- Aesthetics
- Air Quality

- Biological Resources
- Cultural Resources
- Geology and Soils
- Noise
- Transportation/Traffic

The Environmental Checklist/Initial Study determined that, with the incorporation of mitigation measures, there is no substantial evidence, in light of the whole record before the Lead Agency (City of Jurupa Valley), that the Project as revised may have a significant effect on the environment. Therefore, and based on the findings of the Environmental Checklist/Initial Study, the City of Jurupa Valley determined that a MND shall be prepared for the proposed Project pursuant to CEQA Guidelines § 15070(b).

1.4.5 Format and Content of MND

The following components comprise the MND in its entirety:

1. This document, including all Sections. Section 6.0 contains the completed Environmental Checklist/Initial Study and its associated analyses which document the reasons to support the findings and conclusions of the Initial Study;
2. The Mitigation Monitoring and Reporting Program (MMRP) in Section 8.0, which identifies the entities responsible for ensuring the timely and complete implementation of all mitigation measures imposed on the proposed Project to ensure that effects to the environment are reduced to less-than-significant levels. The basis for the MMRP is found in the Environmental Checklist/Initial Study; and
3. Fourteen (14) technical reports that evaluate the effects of the proposed Project, which are attached as Technical Appendices A1-I. These technical reports also are on file and available for public review at the City of Jurupa Valley Planning Department (8304 Limonite Avenue Suite, "M," Jurupa Valley, California 92509) and are hereby incorporated by reference pursuant to CEQA Guidelines §15150.

    A1. Air Quality Impact Analysis
    A2. Mobile Source Air Toxic and Criteria Pollutant Health Risk Assessment
    B1. Biological Technical Report – Project Site
    B2. Biological Technical Report – Adjacent Property
    C1. Cultural Resources Assessment – Project Site
    C2. Paleontological Resources Assessment – Project Site
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    F. Phase I Environmental Site Assessment
    G1. Drainage Study Report
    G2. Project Specific Water Quality Management Plan
    G3. Infiltration Evaluation
    G4. Water and Sewer Availability Letter

H. Noise Impact Analysis
I. Traffic Impact Analysis

4. All plans, policies, regulatory requirements, and other documentation that is incorporated by reference in this document pursuant to CEQA Guidelines §15150.

1.4.6 IS/MND Processing

The City of Jurupa Valley Planning Department directed and supervised the preparation of this IS/MND. Although prepared with the assistance of the consulting firm T&B Planning, Inc., the content contained within and conclusions drawn by this IS/MND reflect the sole independent judgment of the City of Jurupa Valley.

This IS/MND and a Notice of Intent (NOI) to adopt the MND will be distributed to the following entities for a minimum 20-day public review period: 1) organizations and individuals who have previously requested such notice in writing to the City of Jurupa Valley; 2) responsible and trustee agencies (public agencies that have a level of discretionary approval over some component of the proposed Project); 3) the Riverside County Clerk; and 4) the State Clearinghouse. The NOI also will be noticed to the general public in the Riverside County Record, which is a primary newspaper of circulation in the areas affected by the Project. The NOI identifies the location(s) where the IS/MND and its associated MMRP and technical reports are available for public review. During the minimum 20-day public review period, comments on the adequacy of the IS/MND document may be submitted to the City of Jurupa Valley Planning Department.

Following the minimum 20-day public review period, the City of Jurupa Valley will review any comment letters received and determine whether any substantive comments were provided that may warrant revisions to the IS/MND document. If substantial revisions are not necessary (as defined by CEQA Guidelines §15073.5(b)), then the IS/MND will be finalized and forwarded to the Jurupa Valley Planning Commission and City Council for review as part of their deliberations concerning the proposed Project.

The Jurupa Valley Planning Commission has the authority to recommend, conditionally recommend, or not recommend the Project for approval. The Jurupa Valley City Council has exclusive authority to approve, conditionally approve, or deny the Project. Accordingly, public hearings will be held before the Jurupa Valley Planning Commission and City Council to consider the proposed Project and the adequacy of this IS/MND. Public comments will be heard and considered at the hearings. At the conclusion of the public hearing process, the City Council will take action to approve, conditionally approve, or deny the proposed Project. If approved, the City Council will adopt findings relative to the Project's environmental effects as disclosed in the IS/MND and a Notice of Determination (NOD) will be filed with the Riverside County Clerk.

2.0 Project Contact Information

2.0 PROJECT CONTACT INFORMATION

1. Project Title and File Number:

Vernola Marketplace Apartments (Master Application 1485: General Plan Amendment 1404, Zone Change 1405, Specific Plan Amendment 1401, Development Agreement DA1501, Site Development Permit 31416)

2. Lead Agency Name and Address:

City of Jurupa Valley Planning Department, 8304 Limonite Avenue, Suite M, Jurupa Valley, CA 92509

3. Project Location:

East of Interstate 15, north of 68th Street, west of Pats Ranch Road

4. Lead Agency Contact Person(s) and Phone Numbers:

Laurie Lovret, (951) 332-6464

5. Project Sponsor's Name and Address:

Rick Bondar, P.O. Box 1295, Corona, CA 92878

6. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement):

Responsible Agencies: There are no Responsible Agencies, as defined in Section 15381 of the CEQA Guidelines, who have discretionary approval authority over this project.

Other Agencies: Grading and construction activities must be conducted in accordance with the terms of an NPDES General Construction Permit, to be issued by the Santa Ana Regional Water Quality Control Board.

3.0 Environmental Factors Potentially Affected

3.0 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		Land Use and Planning
	Agriculture and Forestry Resources		Mineral Resources
	Air Quality		Noise
	Biological Resources		Population and Housing
	Cultural Resources		Public Services
	Geology and Soils		Recreation
	Greenhouse Gas Emissions		Transportation/Traffic
	Hazards and Hazardous Materials		Utilities and Service Systems
	Hydrology and Water Quality		Mandatory Findings of Significance

Because none of the environmental factors above are "checked," the Project does not require the preparation of an Environmental Impact Report.

4.0 Initial Study Determination

4.0 INITIAL STUDY DETERMINATION

On the basis of this initial evaluation:

I find that the proposed use COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared. ☐

I find that although the proposal could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared. ☑

I find that the proposal MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required. ☐

I find that the proposal MAY have a significant effect(s) 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, if the effect is a "potentially significant impact" or "potentially significant unless mitigated." An ENVIRONMENTAL IMPACT REPORT is required, but it 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, because all potentially significant effect (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION, pursuant to all applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures are are imposed upon the proposed project, nothing further is required. ☐

Signature

City of Jurupa Valley
Agency

Thomas G. Merrell, AICP, Planning Director
Printed Name/Title

Date 01-27-2015

5.0 Background Information and Project Description

5.0 BACKGROUND INFORMATION AND PROJECT DESCRIPTION

The proposed Project involves the construction and operation of an apartment community on an approximately 17.4 acre property in the City of Jurupa Valley, Riverside County, California. The Project proposes to develop the property with 25 apartment buildings housing 397 apartment units and associated amenities including a clubhouse, swimming pool, and landscaped areas. The site also would contain internal drive aisles, parking areas, walls and fencing, utilities, and other infrastructure improvements.

Information about the Project site's location and environmental setting is provided in this Subsection, below. Detailed information about the Project's proposed physical features and construction and operational characteristics is found in Subsection 5.3.

5.1 Environmental Setting

5.1.1 Project Location

The Project site is located in the City of Jurupa Valley in the northwestern portion of Riverside County, California. The City of Jurupa Valley encompasses approximately 43.5 square miles and is located in an urbanizing area of southern California commonly referred to as the Inland Empire. The Inland Empire is an approximate 28,000 square mile region comprising San Bernardino County, Riverside County, and the eastern tip of Los Angeles County. According to the Southern California Association of Governments' (SCAG) 2012 Integrated Growth Forecast, the Inland Empire is a fast-growing metropolitan area with large amounts of available land for future growth.

The approximate population of the City of Jurupa Valley as of January 1, 2014 census data is 97,774 persons, according to the California Department of Finance. SCAG's adopted 2012 Regional Transportation Plan Growth Forecast estimates that the City's population will grow to 103,700 persons by 2020 and 126,000 persons by 2035. The City of Jurupa Valley abuts the city of Fontana (in San Bernardino County) to the north, the cities of Norco and Riverside to the south, the city of Eastvale to the west, and the City of Riverside and County of San Bernardino to the east. Figure 5-1, *Regional Map*, depicts the City of Jurupa Valley and location of the Project site in context to the regional setting.

The Project site is located in the southwestern portion of the City of Jurupa Valley, specifically situated east of Interstate 15 (I-15), north of 68th Street, and west of Pats Ranch Road. The location of the subject property is shown on Figure 5-2, *Vicinity Map*.

The Project site lies within portions of Section 30 of Township 2 South, Range 6 West of the San Bernardino Base and Meridian and includes the following Assessor Parcel Numbers:

Assessor Parcel Numbers:

152-020-012
152-020-021
152-020-022

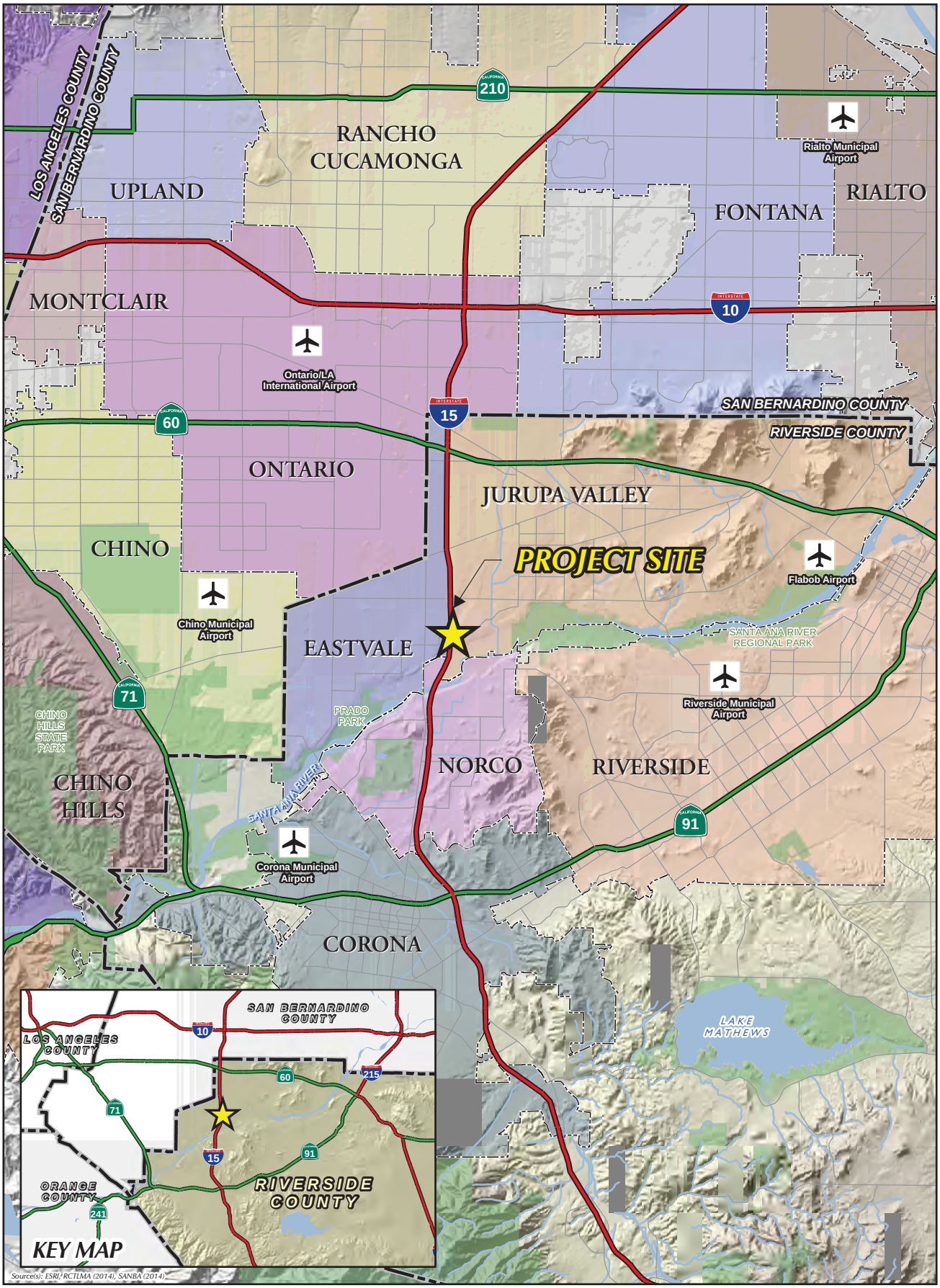

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Figure 5-1

REGIONAL MAP

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Figure 5-2

VICINITY MAP

5.1.2 Surrounding Land Uses and Development

Figure 5-3, *Surrounding Land Uses*, illustrates the existing land uses in the vicinity of the Project site.

North: Located directly north of the Project site is vacant undeveloped land, beyond which are commercial uses that include an optometrist office and Fitness 19. North of Fitness 19 along Pats Ranch Road is the 387,000 s.f. community shopping center known as the "Vernola Marketplace." This commercial center is occupied by several nationwide franchised retail stores, including Lowe's, Michael's, Bed, Bath & Beyond, Ross Dress for Less, Kirkland's, BevMo, Payless Shoe Store, and Petco. Other national franchises located here include Carl's Jr., Del Taco, Jamba Juice, Denny's and Citibank.

South: The Project site is bounded on the south by 68th Street. Located to the south of 68th Street is vacant, undeveloped land formerly used for agricultural purposes that is approved for the future development of 464 single-family residential homes and a neighborhood park site (i.e., the "Riverbend" project, approved by City of Jurupa Valley Resolution 2013-29 on October 17, 2013). South of the Riverbend property is the Santa Ana River.

East: The Project site is bounded on the east by Pats Ranch Road. Located to the east of Pats Ranch Road are single-family detached homes in several neighborhoods that comprise the master planned community of Township Place. Located north of the single-family detached homes is Limonite Meadows Park. To the east of the single-family detached homes is Louis Vandermolen Fundamental Elementary School.

West: To the west of the Project site is Interstate 15 (I-15). Located west of the I-15 Freeway are neighborhoods of single-family detached homes that are located in the City of Eastvale.

5.1.3 Existing Physical Site Conditions

Pursuant to CEQA Guidelines §15125, the physical environmental condition for purposes of establishing the setting of an MND is the environment as it existed at the time the Lead Agency commenced the environmental analysis for the project. The Project's applications were submitted to the City of Jurupa Valley in July 2014, and the environmental analysis for the Project commenced at that time. As such, the environmental baseline for the Project is established as July 2014 and the following subsections provide a description of the Project site's physical environmental condition as of that approximate date. Topics are presented in no particular order of importance.

5.1.3.1 Land Use

Under existing conditions, the property is vacant undeveloped land that contains no structural improvements. Numerous soil piles are found on the eastern half of the site; these are deposits of non-hazardous construction debris from a variety of sources. The existing land use condition is shown on Figure 5-4, *Aerial Photograph*.

5.1.3.2 Topography

The Project site gently slopes north to south in elevation from 624 feet to 644 feet above mean sea level (AMSL). There are no unique or topographic features such as rock outcroppings, present on the Project site. The existing topographic conditions at the Project site are illustrated on Figure 5-5, USGS Topographic Map.

5.1.3.3 Geology

The Project site is located within the Peninsular Ranges geomorphic province of California. The Peninsular Ranges province extends from the Los Angeles Basin southeast to Baja California and the Pacific Ocean eastward to the Coachella Valley and Colorado Desert. The province consists of numerous northwest to southeast-trending mountain ranges and valleys that are geologically controlled by several major active faults. The Project site is located in the northern part of the Perris block, a generally stable area situated between two major faults, the Chino/Elsinore and San Jacinto fault zones. More specifically, the Project site is located on older, uplifted, dissected alluvial surface associated with the Santa Ana drainage, and contains younger alluvial sediments associated with the Santa Ana drainage, and contains younger alluvial sediments associated with a present-day concrete-channelized tributary. The soil materials underlying the Project site are identified as old and very old alluvial deposits (early Pleistocene), with Holocene alluvium in the dissecting tributary. The older deposits are described as mostly well dissected, indurated, sand and gravel deposits. The basement beneath the alluvium consists of Cretaceous granitic and metamorphic rocks of the Riverside area. Refer to Appendix D for additional detail.

The Project site is not located in a Riverside County Recommended Earthquake Fault Study Zone or within any Alquist-Priolo Earthquake Fault Zones, no known faults underlie the site and no active or potentially active faults are trending towards or through the site. The nearest mapped fault is the Chino-Central Avenue Fault Zone, which is located approximately 6.2 miles from the Project site. Similar to other properties throughout southern California, the Project site is located in a seismically active region and is subject to ground shaking during seismic events.

5.1.3.4 Soils

Based on the geotechnical investigation conducted by NorCal Engineering (refer to Appendix D), the exploratory boring and trenches revealed the existing earth materials to consist of a fill and natural soil. A surficial and stockpile fill classifying as brown, fine to medium grained, silty sand to sandy and clayey silt was encountered to a depth of 1 to 18 feet. These soils were noted to be loose/soft to dense/stiff and damp to moist. NorCal Engineering observed several large stockpiles of soil up to approximately 18 feet in height situated along the entire southeast portion of the Project site. An undisturbed alluvium soil classifying as a brown, fine to medium grained, silty sand to sandy silt was encountered beneath the fill and observed to be medium dense/firm and silty to gravelly sands which were noted to be stiff and very dense and moist.

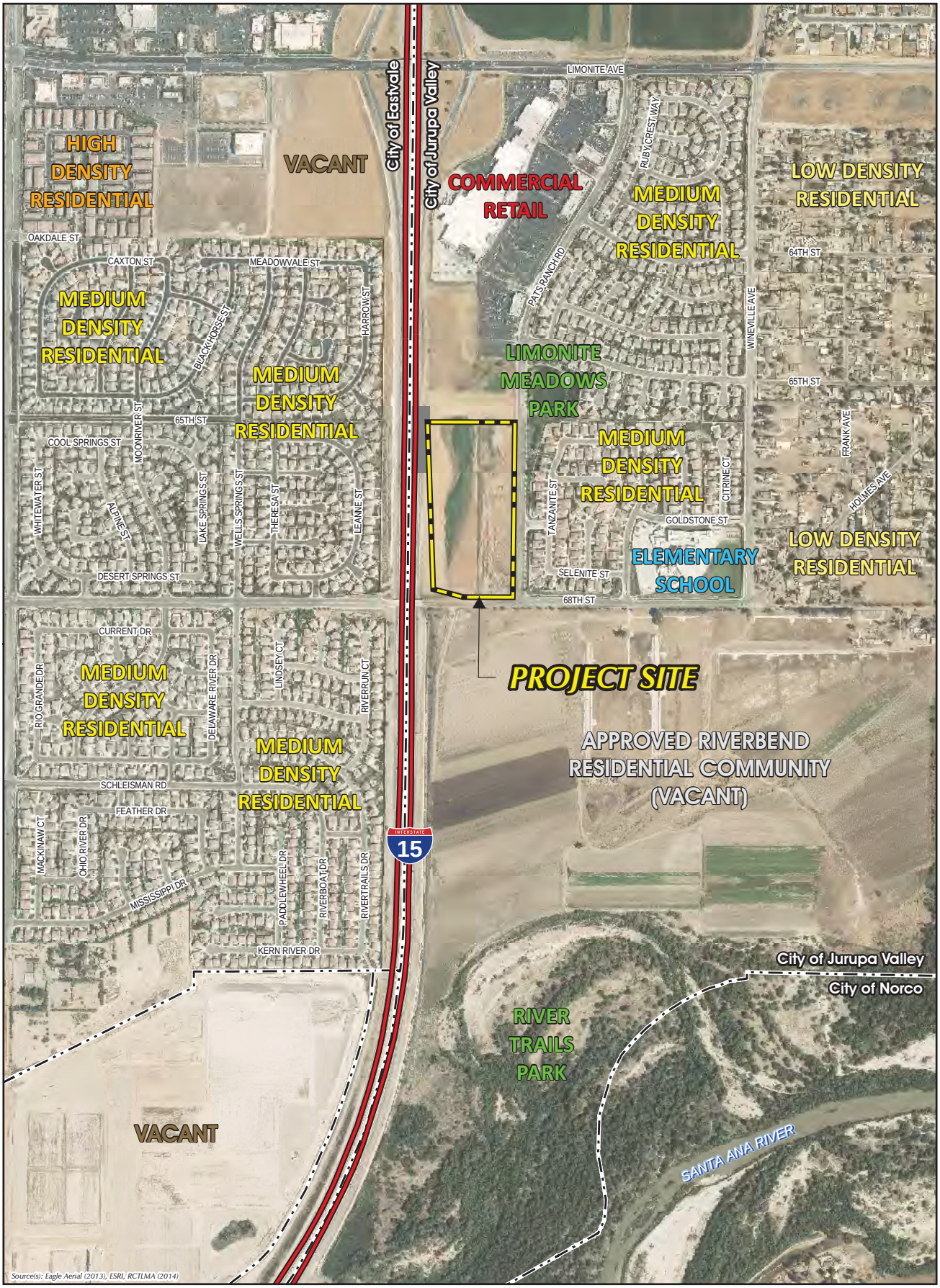

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Figure 5-3

SURROUNDING LAND USES

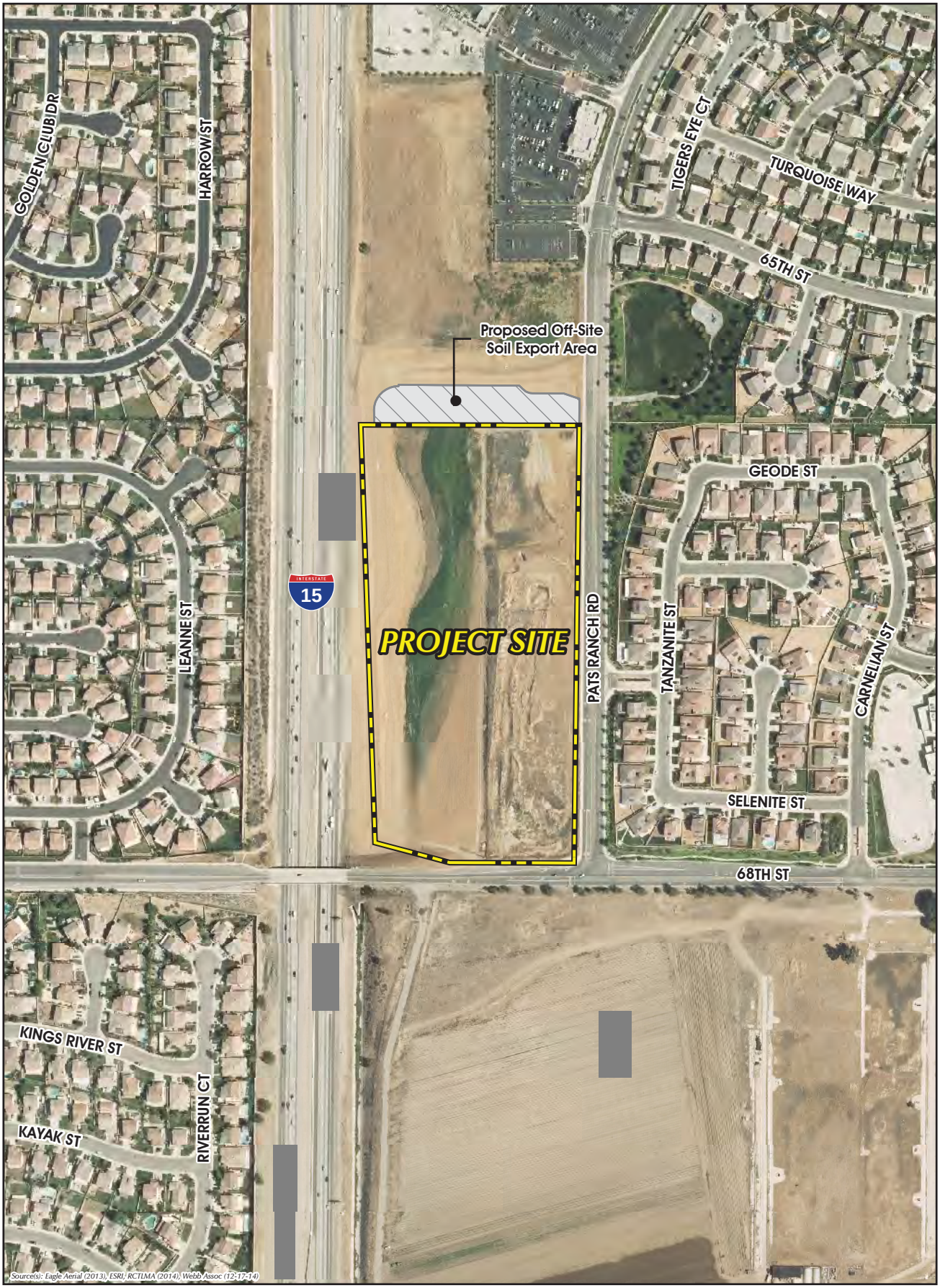

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Figure 5-4

AERIAL PHOTOGRAPH

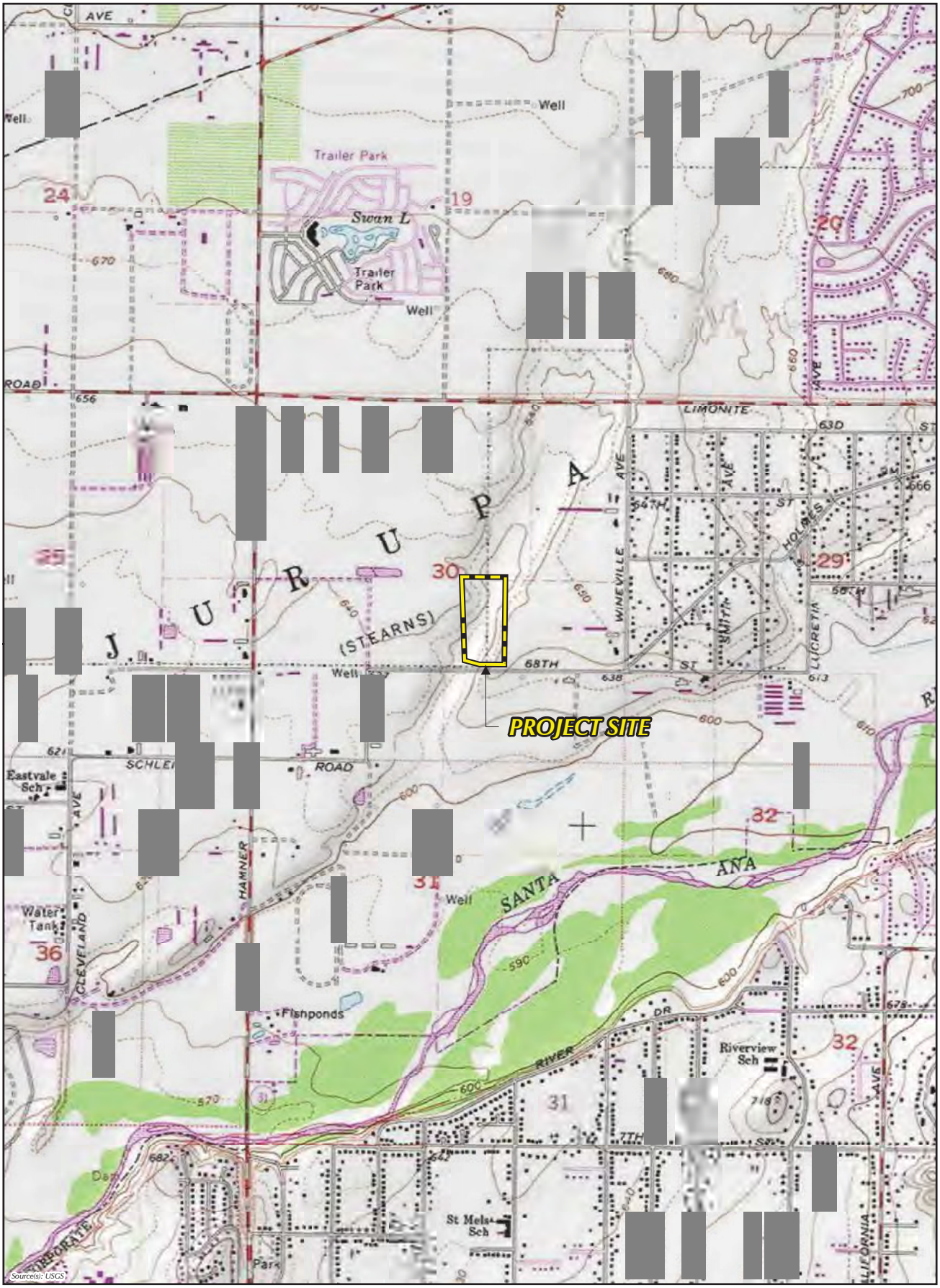

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Figure 5-5

USGS TOPOGRAPHIC MAP

5.1.3.5 Hydrology

Site runoff consists of sheetflow in a generally north-south pattern. Surface flow on site is currently collected by one storm drain inlet located approximately 440 feet north of 68th Street and 50 feet east of the I-15 Freeway right-of-way. This storm drain flows into a RCFCWCD underground reinforced concrete box structure (Line "J") that runs along the western site boundary. The Project site is within the Santa Ana River Watershed, Region 8 of the California Water Resources Control Board. Receiving waters for the property's drainage are the Santa Ana River Reach 3, 2, and 1, which discharge into the Pacific Ocean, and the Prado Basin Area. The Santa Ana River Reach 3 is 303(d) impaired by copper, pathogens, and lead and Reach 2 is impaired by indicator bacteria. Before discharging into the Pacific Ocean approximately 43 miles west of the Project site, the tidal prism of the Santa Ana River and Newport Slough is impaired by pathogens.

The subject site is not located in a 100-year flood hazard zone delineated by the Federal Emergency Management Agency (FEMA). The site is not in an area threatened by potential inundation due to dam or levee failure, or by seiche, tsunamis, or mudslides.

5.1.3.6 Vegetation Communities

The entire Project site is disturbed and is either unvegetated or is dominated by non-native, ruderal species. The Project site does contain any special-status vegetation types, including those identified by the California Natural Diversity DataBase.

5.1.3.7 Wildlife

The Project site is not located within United States Fish and Wildlife Service (USFWS) designated critical habitat areas. No special-status animals were detected during the biological survey at the Project site, although a few species have the potential to occur. Species that have a low probability of occurrence on the site include the California horned lark and San Diego black-tailed jackrabbit. The Project site provides suitable foraging habitat for a number of raptor species, including special-status raptors. For example, the disturbed, loose soils provide suitable habitat for the burrowing owl, a raptor species classified as "sensitive" by the California Department of Fish and Wildlife (CDFW).

5.1.3.8 Cultural Resources

The Project site is not known to have unique historical significance to the region. No structures exist on the Project site. No known historic resources exist on the Project site.

From an archaeology perspective, human habitation of southern California dates back to approximately 13,000 years ago. Over a series of cultural periods, the area transitioned from a hunting and gathering society, to settlements of small groups of people, to large occupations near natural water sources, to formations of distinct ethnographic groups. The Project site is located on the boundary of the traditional cultural territories of the Cahuilla and the Gabrielino; these territorial boundaries were somewhat fluid and changed through time. Like other Native American groups in Southern California, the Cahuilla and the Gabrielino were semi-nomadic hunter-gatherers who subsisted by exploitation of seasonably available plant and animal resources and were first

encountered by the Spanish missionaries in the late 18th Century. Cultural resources investigations on the Project site were conducted on site by LSA and no Native American or other cultural artifacts were identified. No known cultural resources exist on the Project site. Refer to Appendix C1 for additional detail.

The Project site contains deposits of high paleontological sensitivity. These high sensitivity deposits include the Late to Middle Pleistocene Old Alluvial Channel Deposits mapped in the southeastern portion of the Project site and the Early Pleistocene Very Old Alluvial Channel Deposits mapped in the northwestern portion of the Project site. In addition, the Young Alluvial Channel Deposits, mapped in the central portion of the Project site, have a low paleontological sensitivity rating from the surface to a depth of 5 feet and a high paleontological sensitivity rating below that mark. Refer to Appendix C2 for additional detail.

5.1.3.9 Transportation

Regional access to the Project site and surroundings is provided by the I-15 Freeway, which abuts the western boundary of the Site. Limonite Avenue, classified as an Urban Arterial Highway, is the major east-west thoroughfare in this area, located approximately one-half mile north of the Project site. Limonite Avenue forms a complete interchange with the I-15 Freeway, with ramps in both directions. Other major roadways providing vehicular circulation in this area include: Wineville Avenue, an Arterial Highway located east of the Project site and north of Limonite Avenue, and Hamner Avenue, a Major Highway located west of the Project site, on the western side of I-15. The Project site is bordered on the east side by Pats Ranch Road, a divided, four-lane street providing two lanes in both the north and south directions. On the south side of the site is 68th Street, currently built as an undivided two lane street adjacent to the Site, but transitioning to a divided 4-lane road west of I-15 and a divided three lane road east of Pats Ranch Road.

Riverside Transit Authority operates public bus service in this area, including Routes 29 and 3 with stops nearby along Pats Ranch Road. Field observations conducted in March 2014 indicate nominal pedestrian and bicycle activity within the study area. Existing sidewalks are found along both sides of Pats Ranch Road, including the Project site frontage, and along the north side of 68th Street, to the east and west of the Project site. There is no sidewalk along the 68th Street site frontage. The Eastvale Area Plan identifies 68th Street as a future Community Trail. The nearest Class II bike lanes are located along both sides of Hamner Avenue, in the Eastvale area on the west side of I-15.

5.1.3.10 Noise

The vacant Project site currently generates no regular stationary or mobile noise. Primary noise sources in this area include vehicular traffic on the I-15 Freeway and the surrounding arterial street network. Minor noise sources include outdoor activities at residential and park sites to the east, and parking lot activities within the shopping center located several hundred feet north, at the southeast quadrant of the I-15/Limonite Avenue interchange. Noise measurements taken at the Site indicate existing exterior noise levels ranging from approximately 47 dBA (CNEL) to approximately 76 dBA (CNEL) in the western part of the Site, where noise from the freeway is dominant.

5.1.3.11 Air Quality and Climate

The Project site is located in the 6,745-square-mile South Coast Air Basin (SCAB), which includes portions of Los Angeles, Riverside, and San Bernardino Counties, and all of Orange County. The SCAB is bound by the Pacific Ocean to the west, the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east, and the San Diego County Line to the south. The SCAB is within the jurisdiction of South Coast Air Quality Management District (SCAQMD), the agency charged with bringing air quality in the SCAB into conformity with federal and state air quality standards. The climate of the SCAB is characterized as semi-arid and more than 90% of the SCAB's rainfall occurs from November through April. During the dry season, which also coincides with the months of maximum photochemical smog concentrations, the wind flow is bimodal, characterized by a daytime onshore sea breeze and a nighttime offshore drainage wind.

The SCAQMD monitors levels of various criteria pollutants at 30 monitoring stations throughout the SCAB. In 2013, federal and state ambient air quality standards were exceeded on one or more days for ozone, PM10, and PM2.5 at most monitoring locations, including the monitoring stations nearest to the Project site. No areas of the SCAB exceeded federal or state standards for NO2, SO2, CO, sulfates, or lead.

5.1.3.12 Utilities and Service Systems

Domestic water service and sanitary sewer service are provided to this area by the Jurupa Community Services District (JCSD). Existing water and sewer mains are found in the adjacent segments of Pats Ranch Road and 68th Street that can provide service for the proposed Project. The JCSD has indicated that there are sufficient water supplies and sufficient wastewater treatment plant capacity to meet the needs of this Project. Storm runoff from the Site currently flows into a single storm drain that discharges into a Riverside County Flood Control and Water Conservation District (RCFCWCD) regional drainage structure that runs along the western site boundary. The Badlands and El Sobrante Landfills currently accept all of the municipal solid wastes generated throughout Jurupa Valley and both have substantial remaining capacity to accept the wastes generated by the proposed Project.

5.2 Planning Context

The City of Jurupa Valley is an incorporated city of Riverside County, California. Prior to its incorporation, the area was governed by Riverside County. On March 8, 2011, voters approved a ballot measure designated "Measure A" to incorporate the area into its own city. As a result, the City of Jurupa Valley became an incorporated city on July 1, 2011. City of Jurupa Valley Ordinance Nos. 2011-01 and 2011-10 adopted all ordinances and resolutions of the County of Riverside in effect as of July 1, 2011 (including land use ordinances and resolutions), to remain in full force and effect as City Ordinances. As such, development activities that occur in the City of Jurupa Valley are regulated by the Riverside County General Plan, including the Jurupa Area Plan and applicable portions of the Eastvale Area Plan, and Riverside County Zoning Ordinance (Ordinance No. 348) and Subdivision Ordinance (Ordinance No. 460) that were in effect on July 1, 2011, unless otherwise superseded by a City ordinance or resolution. The Project site is located within the Eastvale Area Plan.

5.2.1 General Plan

As described above, the prevailing planning document for the proposed Project site is the Riverside County General Plan (hereafter "City of Jurupa Valley General Plan"), as it was in effect on July 1, 2011, unless otherwise superseded by a City ordinance or resolution. To-date, the Jurupa Valley City Council has approved three ordinances affecting the General Plan that is applicable to the Project site and supersedes the County's General Plan. Specifically, City Ordinance No. 2013-02, approved on April 18, 2013, deleted Riverside County Ordinance No. 348, Article 1I, Section 2.5, Subsection 2.5(a)(4), "General Plan Foundation Component Amendments - Regular" from the City's Municipal Code and replaced it with City Municipal Code Section 9.10.050 "Foundation Component Changes." Ordinance No. 2013-04, adopted May 16, 2013, added Section 9.10.070, Private Landowner General Plan Amendments, and amended Section 9.10.050 Foundation Component Changes, in Chapter 9.10, amendments to the County Zoning Ordinance, in Title 9, Planning and Zoning of the Jurupa Valley Municipal Code, to simplify the process for landowner initiated amendments to the General Plan. Lastly, Resolution No. 2014-42, approved on November 6, 2014 (after the environmental analysis for this MND commenced), added an Environmental Justice Element to the City's General Plan.

The General Plan is divided into a number of Area Plans that provide additional guidance for development and more specific land use designations under each Foundation Component category. Thus, each property has a Foundation Component land use designation and a more descriptive Area Plan designation. The Project site is located within the boundary of the Eastvale Area Plan.

5.2.1.1 Land Use Designations

The General Plan Foundation Component currently assigned to the Project site is Community Development: Light Industrial (LI, as provided by the Interstate 15 Corridor Specific Plan No. 266). This Specific Plan is discussed in subsection 5.2.1.3. Refer to Figure 5-6, *Existing General Plan and Area Plan Designation.* The LI Designation allows for industrial and related uses including warehousing, distribution, assembly and light manufacturing, repair facilities, and supporting retail uses with a building intensity range floor-to area-ratio (FAR) of 0.25-0.60 FAR. Please note that the Mira Loma Warehouse & Distribution Policy Area supersedes this and warehouse and distribution uses are not permitted.

The adjacent properties to the north are designated Community Development: Light Industrial (LI) and Community Development: Public Facilities (PF). The PF land use designation allows for civic uses such as County administrative buildings and schools at a building intensity range of less than or equal to 0.60 FAR. Pats Ranch Road provides the eastern boundary of the Project site. Properties east of Pats Ranch Road are designated Community Development: Medium Density Residential (MDR). The MDR land use designation allows for single-family detached and attached residences with a density range of 2-5 du/ac. Limited agriculture and animal keeping is permitted. Lot sizes range from 4,000 to 6,000 s.f. Located to the northeast of the Project site, and east of Pats Ranch Road is property designated Open Space- Recreation (OS-R). The OS-R land use designation allows for recreational uses including parks, trails, athletic fields, and golf courses. Neighborhood parks are allowed within residential land uses. 68th Street provides the southern boundary of the Project site. Located south of 68th Street are properties designated Community Development:

Medium Density Residential (MDR). Interstate 15 is located immediately west of the Project site. Located west of I-15 are properties designated as Medium Density Residential (MDR) in the City of Eastvale.

A summary of the existing General Plan land use and zoning designations for the Project site and surrounding properties is provided in Table 5-1, Existing General Plan & Zoning Designations, and is discussed below in Subsection 5.2.2.

Table 5-1 Existing General Plan & Zoning Designations

Location	General Plan Land Use Designation	Zoning Designation
Project Site	LI	I-P
Adjacent Property to the North	LI, PF, OS-R	I-P, A-2-10
Adjacent Property to the South	MDR	R-4
Adjacent Property to the East	MDR	R-1
Adjacent Property to the West	MDR	R-4

Source: (City of Jurupa Valley, July 2014)

5.2.1.2 Policy Areas

Policy Areas apply to portions of an Area Plan that contain special or unique characteristics that merit detailed attention and focused planning policies. The Project site is not located within a Policy Area.

5.2.1.3 Specific Plans

The Project site is partially located within the Interstate 15 Corridor Specific Plan No. 266. This Specific Plan was originally adopted by the Riverside County Board of Supervisors in November 2003 to provide a comprehensive land use plan and governing regulations for the long range development of a 757.7 acre area, to be comprised of a mix of residential, industrial, and commercial uses that would serve the full range of local, community and regional needs. The western part of the Project site, adjacent to the I-15 Freeway, is within Planning Area 5 of the Specific Plan, and is designated as "Industrial Park (IP)." This area was intended for development of light industrial and office uses. The eastern part of the Project site was not included in the Specific Plan. Refer to Figure 5-7, Specific Plan 266 Boundary, for an illustration of the entire Specific Plan area.

5.2.2 Zoning

The Project site is zoned "Industrial Park (IP)." Refer to Figure 5-8, *Existing Zoning Designations.* City Ordinance No. 2012-10 requires Planning Commission approval of a Conditional Use Permit for a variety of permitted uses in this zone, including warehouse and distribution centers, recycling collection and processing facilities, lumber yards, vehicle storage, mini storage facilities, and recreational vehicle storage areas. Please note that the Project site is also governed by the Mira Loma Policy Area, which supersede the IP zoning standards; for example, warehouse and distribution centers are not permitted.

Properties located to the north of the Project site are zoned Industrial Park (IP) and Heavy Agriculture (A-2-10). Properties located to the south of the Project site are zoned Planned Residential (R-4). Properties located to the east of the Project site are zoned One-Family Dwellings (R-1). A summary of the existing zoning designations for the Project site and surrounding properties is provided above in 0.

5.3 Project Description

The proposed Project is a development plan to construct a 397-unit apartment community on the 17.4 acre subject property. The Project requires approvals of applications for a General Plan Amendment (GPA1404), Change of Zone (CZ1405), Specific Plan No. 266 Amendment No. 3 (SP1401), Development Agreement (DA1501), and Site Development Permit (SDP31416). The entitlement applications for the proposed Project are herein incorporated by reference pursuant to CEQA Guidelines §15150 and are available for review at the City of Jurupa Valley Planning Department, 8304 Limonite Avenue, Suite M, Jurupa Valley, California 92509. A detailed description of the proposed Project is provided below.

5.3.1 Proposed Discretionary Approvals

5.3.1.1 General Plan Amendment No. 1404 (GPA1404)

General Plan Amendment No. 1404 (GPA1404) proposes to change the Project site's General Plan land use designation from Community Development: Light Industrial (LI) to Community Development: Highest Density Residential (HHDR). The HHDR land use designation allows for multi-family dwellings, including apartments and condominiums with multi-stories (3+ stories), at a building intensity of 20+ dwelling units per acre (du/ac). Refer to Figure 5-9*, General Plan Amendment No. 1404.*

5.3.1.2 Change of Zone No. 1405 (CZ1405)

Change of Zone No. 1405 (CZ1405) proposes to change the Project site's zoning designation from Industrial Park (IP) to General Residential (R-3). Refer to Figure 5-10, *Change of Zone No. 1405.*

5.3.1.3 Specific Plan Amendment (SP1401)

Under existing conditions, a 10.2-acre portion of the Project site is located in Specific Plan No. 266 (I-15 Corridor Specific Plan), Planning Area 5. The remaining 7.2-acre portion of the Project site is not located within the Specific Plan boundary. As part of the Proposed Project, the Project Applicant submitted a Specific Plan Amendment application (SP1401) to the City of Jurupa Valley to remove the 10.2-acre portion of the Project site from Specific Plan No. 266. As a result, Planning Area 5 of the Specific Plan would be reduced from 22.6 acres to 12.4 acres, and would no longer cover any portion of the Project site.

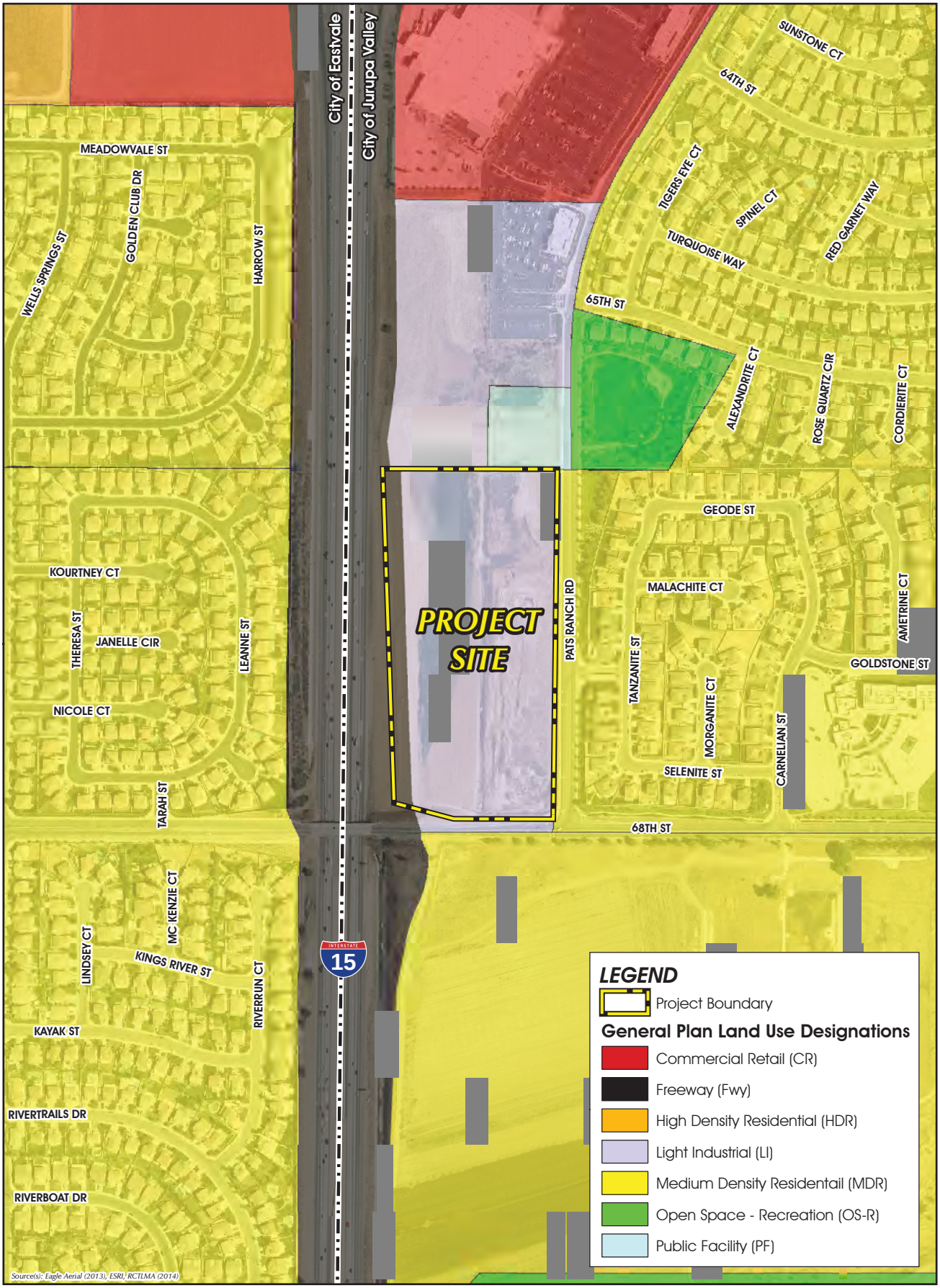

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Figure 5-6
EXISTING GENERAL PLAN AND AREA PLAN DESIGNATION

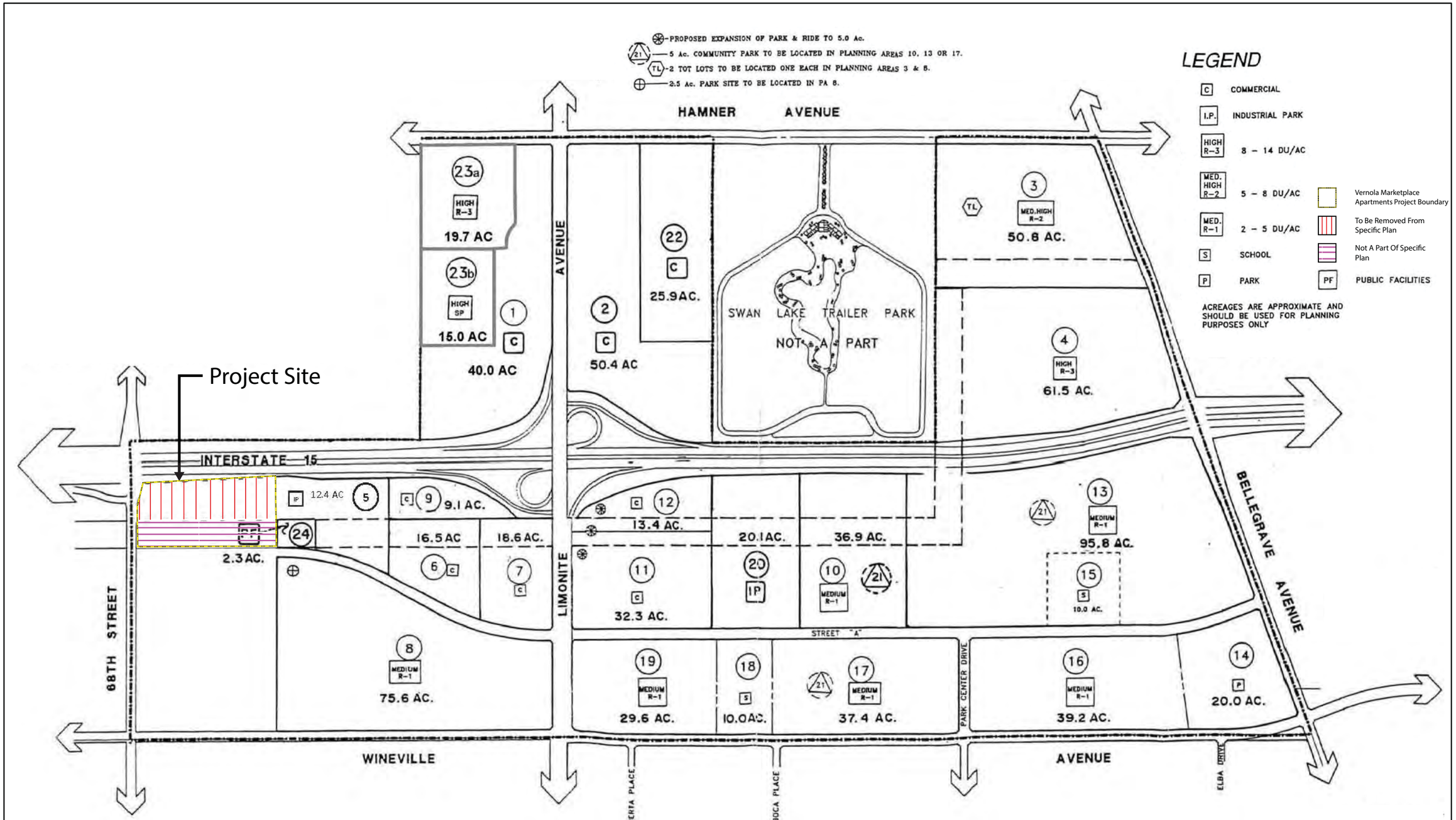

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Figure 5-7

SPECIFIC PLAN 266 BOUNDARY

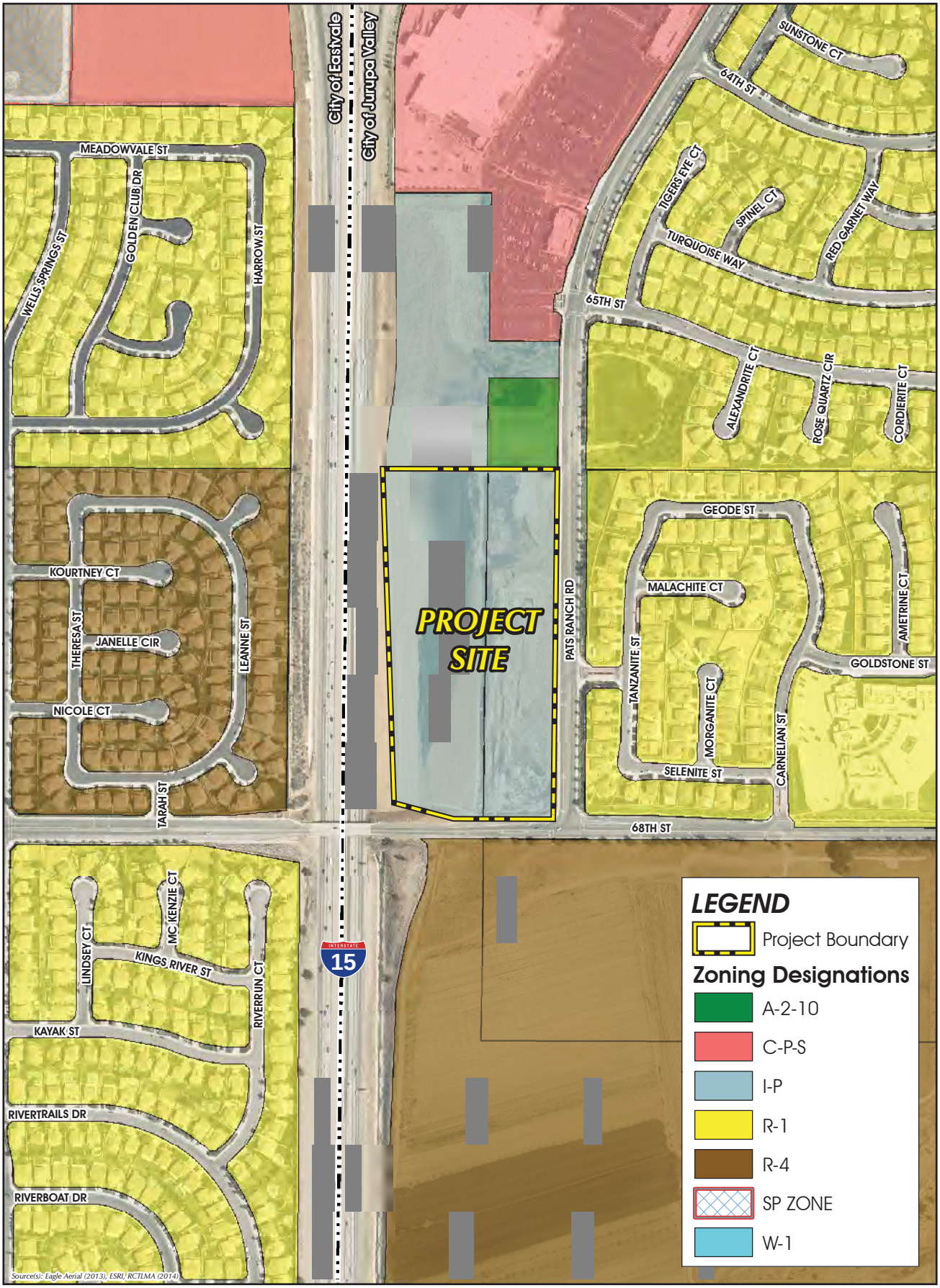
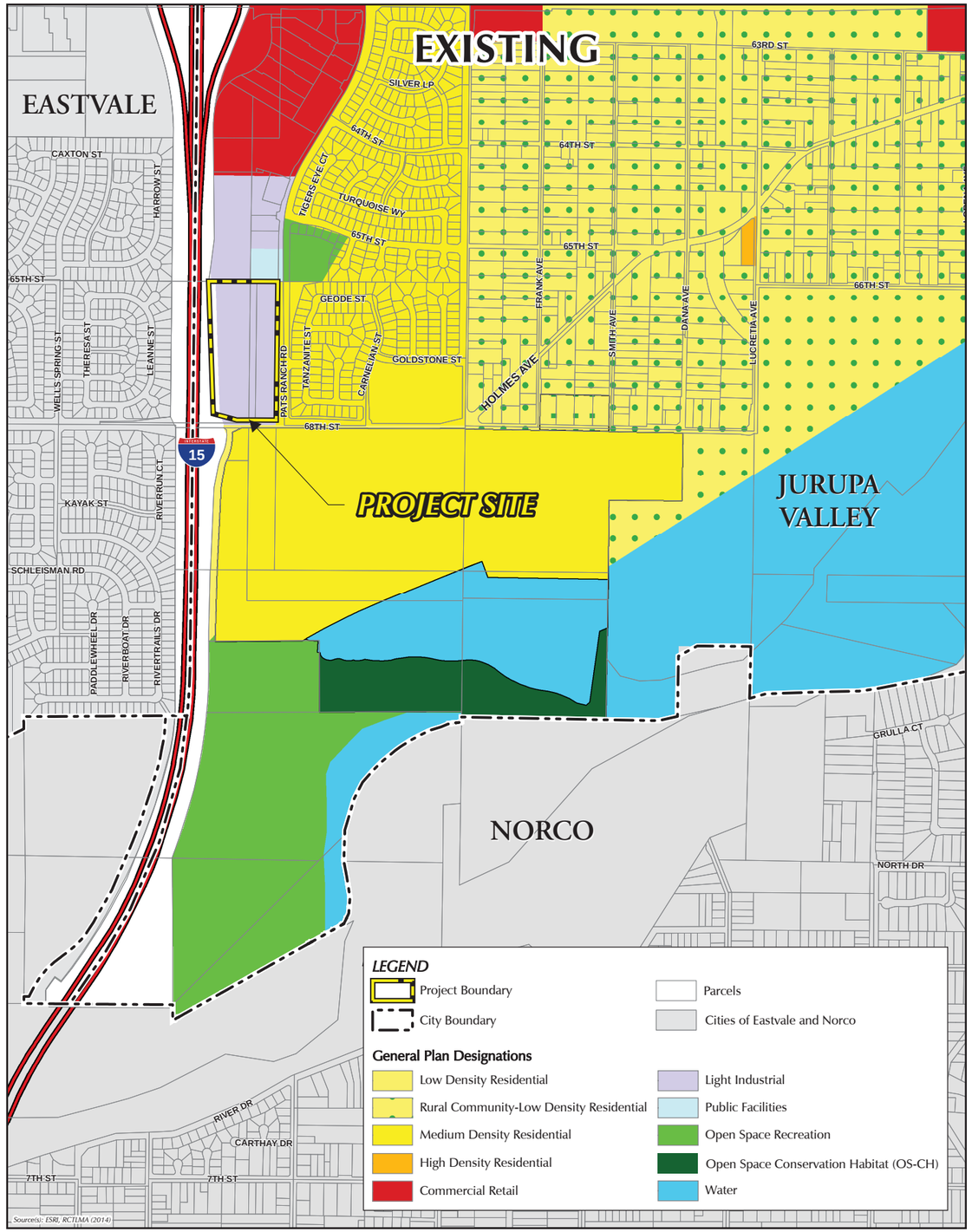


Figure 5-8

EXISTING ZONING DESIGNATIONS



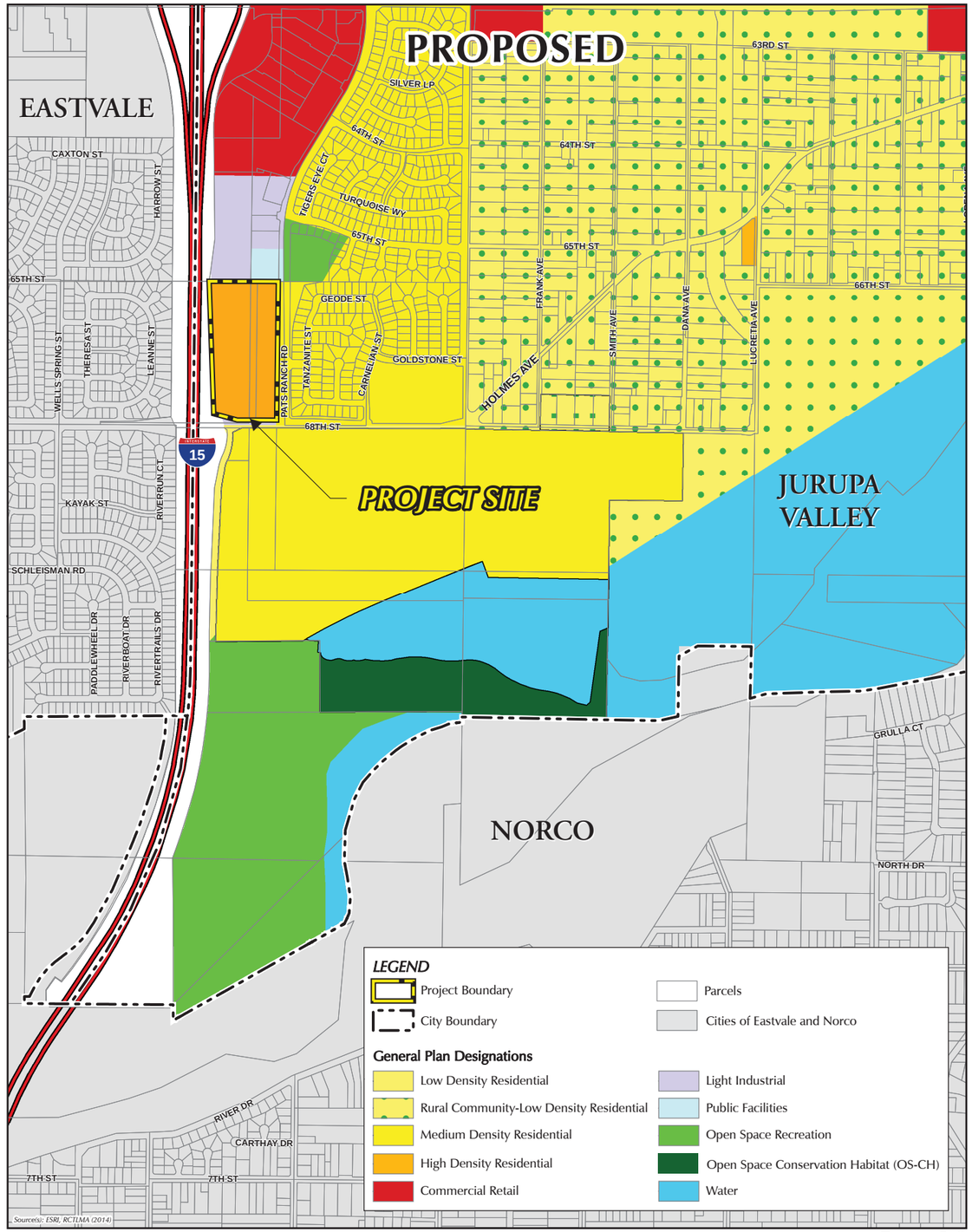
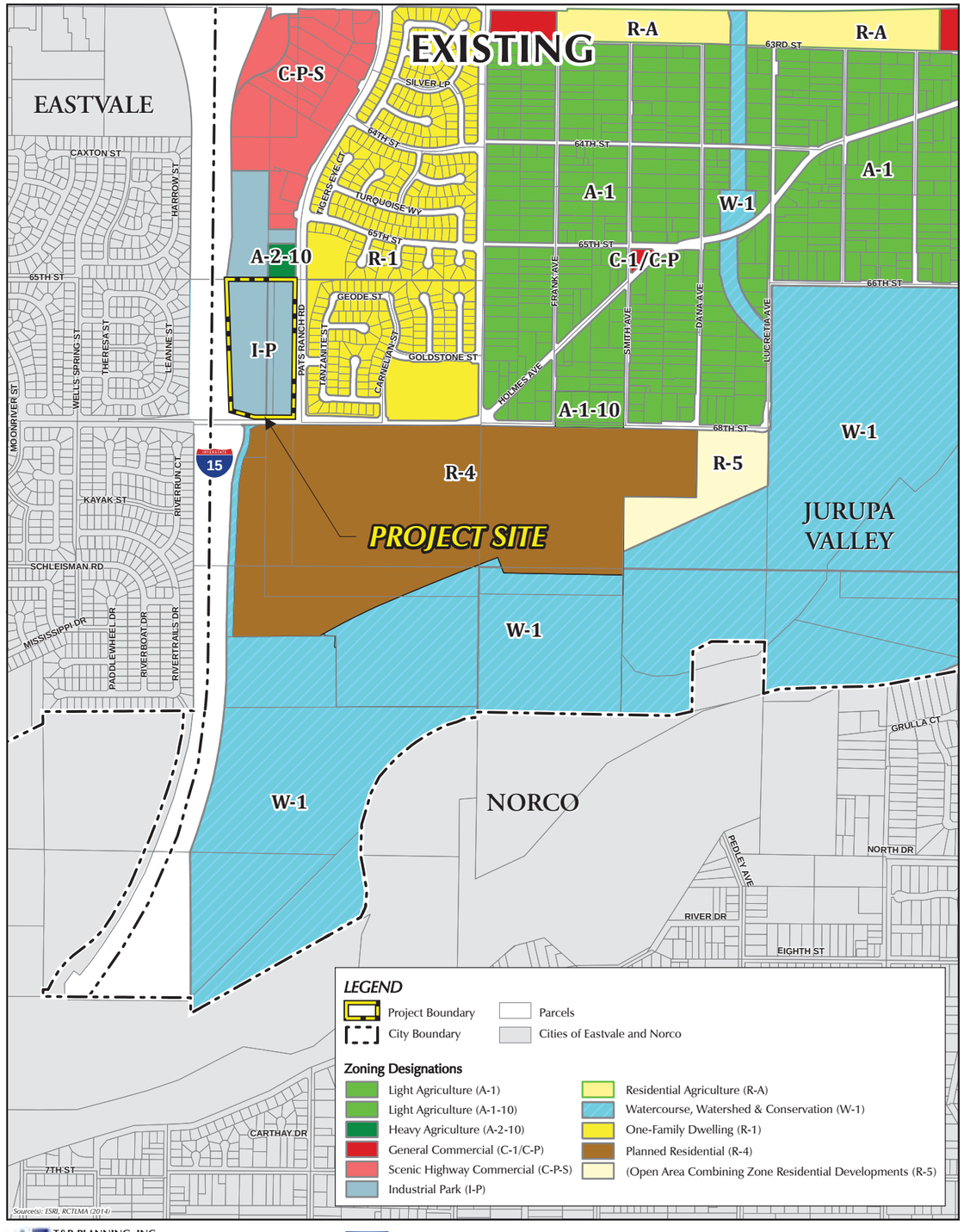


Figure 5-9

GENERAL PLAN AMENDMENT NO. 1404



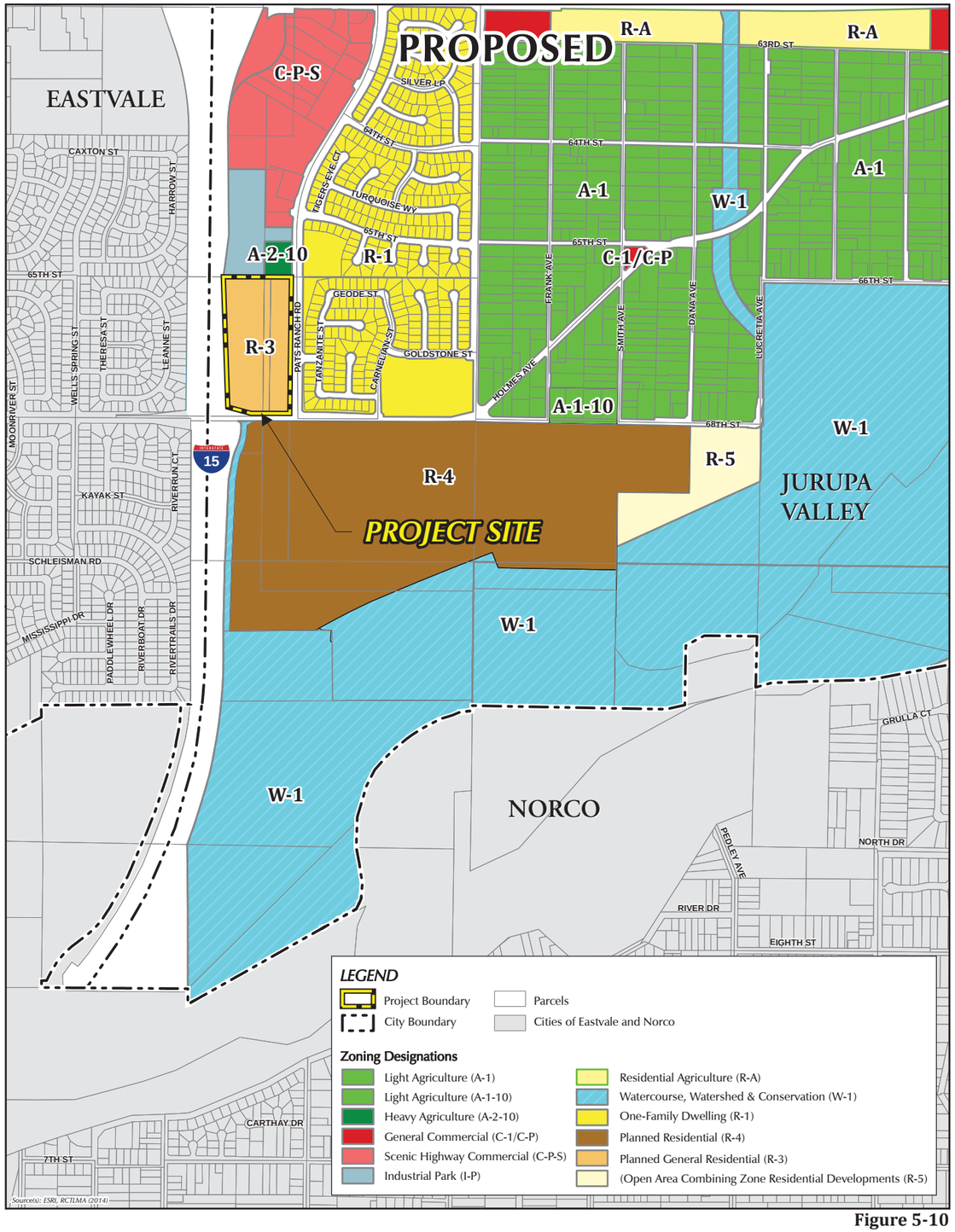


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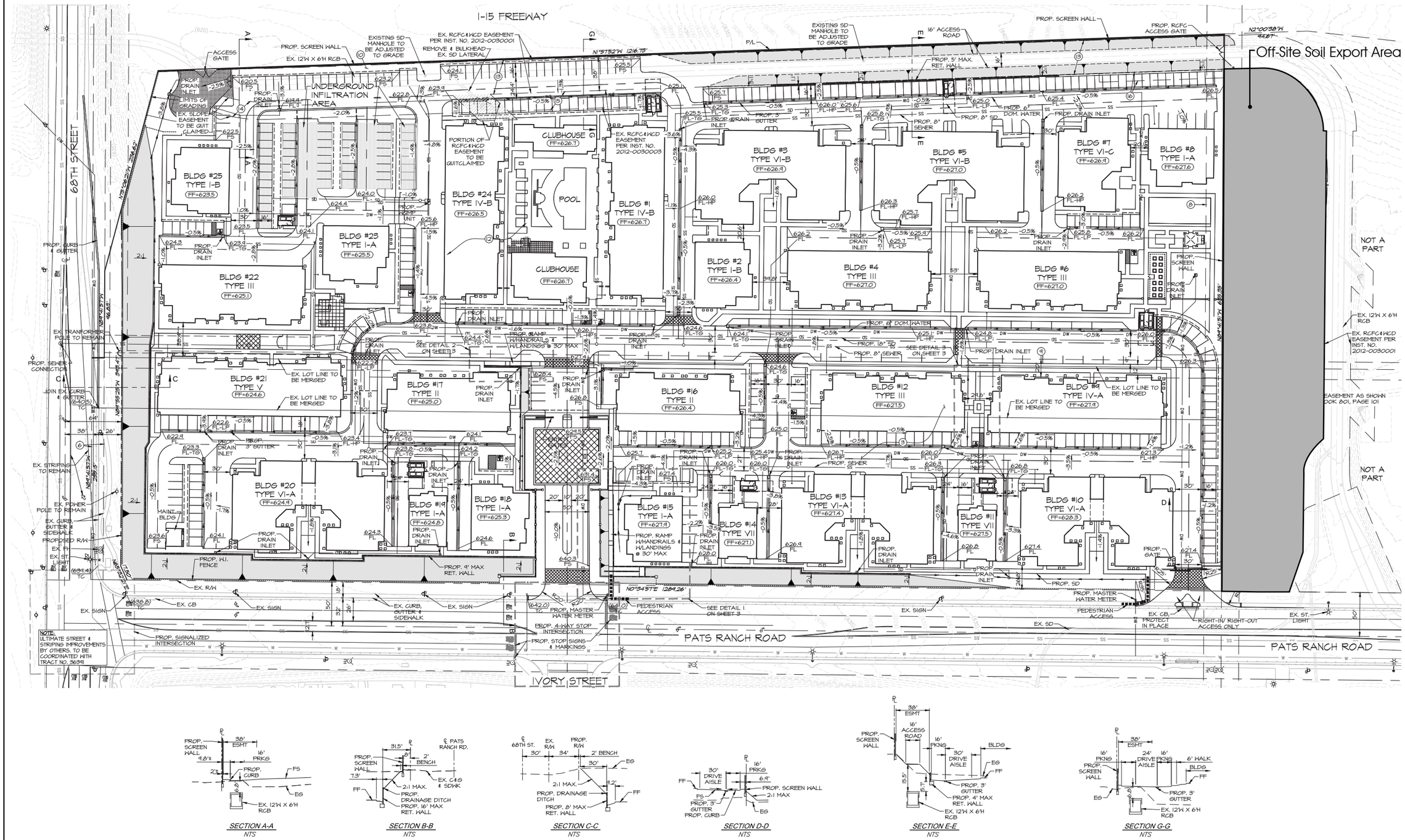
Figure 5-10

CHANGE OF ZONE NO. 1405



Source(s): Webb Associates (09-24-14)

Figure 5-11

SITE DEVELOPMENT PERMIT NO. 31416

5.3.1.4 Development Agreement (DA1501)

The Project Applicant and the City of Jurupa Valley proposed to enter into a Development Agreement related to the proposed Project. California Government Code Sections 65864-65869.5 authorizes the use of development agreements between any city, county, or city and county, with any person having a legal or equitable interest in real property for the development of the property. The Development Agreement would provide the Project Applicant with assurance that development of the Project may proceed subject to the rules and regulations in effect at the time of Project approval. The Development Agreement also would provide the City of Jurupa Valley with assurance that certain obligations of the Project Applicant will be met, including but not limited to, how the project will be phased, the required timing of public improvements, the Applicant's contribution toward funding community improvements, and other conditions.

5.3.1.5 Site Development Permit (SDP31416)

As shown on Figure 5-11, *Site Development Permit No. 31416,* SDP31416 proposes the following site improvements: 25 apartment buildings, housing a total of 397 apartment units; two clubhouses; one swimming pool; one maintenance building, landscaping, a dog park, underground utilities, walls and fences on 17.4 acres. SDP31416 provides for garages, carports and open parking stalls that combined would provide a total of 806 motor vehicle parking spaces. A detailed description of the proposed development and design characteristics of SDP31416 is provided below.

A. Site Development and Site Design Characteristics

1. Conceptual Architecture

The apartment community would be comprised of 25 apartment buildings housing 397 apartment units. The building/unit mix would consist of 1, 2, and 3-bedroom units and would offer a variety of floor plans comprised of first, second, and third floor plans. The buildings would reach a maximum height of 43 feet 5 inches. The apartment buildings' exterior walls would be built of stucco material with varying shades of white and brown, with green accents as the color features. Roofing material would be comprised of concrete "S-tile" roofing. Other proposed exterior architectural design features include vinyl windows, shutters, trim, and vertical tube metal railings on the first floor patios and also on 2nd and 3rd floor balconies. Figure 5-12, *Conceptual Architecture*, provides a representative sample of the architecture style, colors and materials proposed by the Project. The complete architectural plans package is available for review as part of the SDP application materials at the City of Jurupa Valley Planning Department.

2. Proposed Walls and Fences

As shown on Figure 5-11, a screen wall is proposed along the western Project boundary to buffer the Project from adjacent I-15. In addition, as shown on Figure 5-12, an existing berm along a portion of the westerly Project boundary would assist in screening the Project from I-15, while at the same time providing noise attenuation for the Project site. The apartment community would be surrounded by a retaining wall of varying heights. In addition, a 5-foot (maximum height) retaining wall is proposed on the east side of the Riverside County Flood Control and Water Conservation District (RCFCWCD) access road. A wrought iron fence is proposed along the easterly Project boundary and a solid screen wall is proposed along the northern Project boundary.

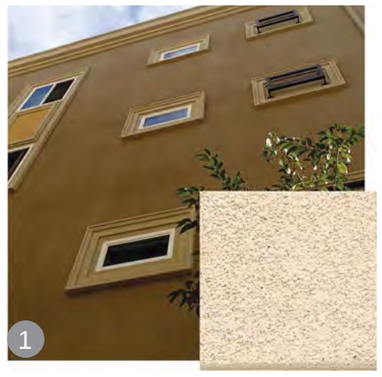
3. Proposed Amenities and Landscape Features

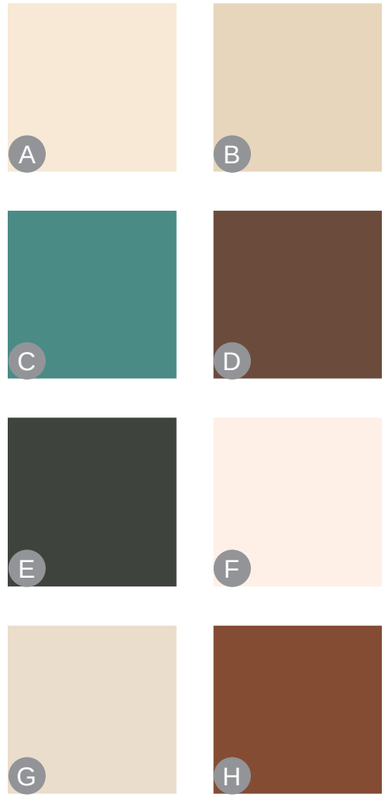
As shown on Figure 5-13, *Conceptual Landscape Plan*, the Project proposes the following outdoor amenities and landscape features:

- **Entry Motor Court**. A motor court with vehicular gates and decorative paving is proposed at the main site access driveway on Pats Ranch Road, which would align with Ivory Street opposite the Project site.
- **Central Pool Area.** A central pool area is proposed in the western portion of the site, directly west of the Entry Motor Court and would be comprised of a lap pool, sun deck, and private cabanas.
- **Entertainment Courtyard**. An entertainment courtyard is proposed in the Central Pool Area and would be comprised of an outdoor kitchen area.
- **Outdoor Room with Central Fireplace**. An outdoor room with central fireplace is proposed in the Central Pool Area.
- **Mailbox Courtyard.** A mailbox courtyard is proposed in the Central Pool Area.
- **Pedestrian Promenade**. A Pedestrian Promenade is proposed between the eastern and western portions of the apartment community. The Promenade would be comprised of landscaped and shaded parkways that would provide a linkage to the community's major amenities and landscaped courtyards.
- **Village Green**. A village green comprised of an open play turf area, a community garden, a picnic shade structure with BBQ, and a large tot lot, is proposed near the northern boundary of the Project site.
- **Semi-Private Courtyard.** A semi-private courtyard comprised of ornamental landscaping, a BBQ, and seating nodes is proposed near the northeast corner of the Project site.
- **Secondary Gated Entry with Decorative Paving**. A secondary gated entry with decorative paving is proposed in the northeast corner of the Project site.
- **Outdoor Lounge.** An outdoor lounge with decorative patio partially enclosed with low walls, a central kitchen with bar counter seating under a shade structure, and a fire pit is proposed in the southerly portion of the apartment community.
- **Green Paseo**. A green paseo which would act as an extension of the pedestrian promenade is proposed in the southerly portion of the apartment community. The green paseo would be comprised of an open turf play area with climbing/sculpture toys.
- **Dog Park.** A dog park comprised of an enclosed area with a dog washing station is proposed in the southwesterly corner of the apartment community.
- **15-Foot Wide Easement Access Drive**. A 15-foot wide easement access drive comprised of decomposed granite is proposed along the westerly Project boundary.
- **Pine Tree Screen from I-15**. A screen of pine trees is proposed near the southwestern Project site boundary.
- **Existing Berm along I-15 Frontage**. An earthen berm along a portion of the western Project boundary would remain in its existing location.
- **38-Foot Wide Flood Control Easement.** A Riverside County Flood Control and Water Conservation District (RCFCWCD) easement exists along a portion of the westerly Project boundary. There would be no vehicular access to the easement by Project site residents.

SCHEME 1

SCHEME 2





COLOR / MATERIAL LEGEND

MATERIALS:

1. *STUCCO - 20/30 SAND*
2. *EAGLE ROOFING: CAPISTRANO - WALNUT CREEK BLEND (3773)*
3. *EAGLE ROOFING: CAPISTRANO - ALBUQUERQUE BLEND (8830)*
4. *VERTICAL TUBE METAL RAILING - PAINT GRADE*
5. *VINYL WINDOW - "ALMOND" COLOR*

COLORS:

A. *STUCCO (SCHEME 1) - WHITE SAND (DEW 336)*
B. *STUCCO (SCHEME 1) - SAND DOLLAR (DE 6171)*
C. *SHUTTERS (SCHEME 1) - ASPEN HUSH (DE 5746)*
D. *TRIM - WILD MUSTANG (DEA 161)*
E. *RAILING - IRON RIVER (DEA 176)*
F. *STUCCO (SCHEME 2) - PALE WHEAT (DE 6106)*
G. *STUCCO (SCHEME 2) - STUCCO TAN (DE 6205)*
H. *SHUTTERS (SCHEME 2) - ROXY BROWN (DE 6084)*

Source(s): Architects Orange (09-26-14)

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Figure 5-12

CONCEPTUAL ARCHITECTURE

AMENITY LEGEND

1. Entry Motor Court:
   - Vehicular Gates
   - Decorative Paving
   - Directory
2. Central Pool Area:
   - 30 x 70 lap pool with free play area to the side
   - Large sun deck
   - Private cabanas
3. Entertainment Courtyard:
   - Outdoor kitchen
   - Lounge type furniture
   - Bar countertop with decorative strip lights above
4. Outdoor Room with Central Fireplace
5. Mailbox Courtyard
6. Pedestrian Promenade:
   - Lushly landscaped and shaded parkways providing pedestrian linkage to community's major amenities and landscaped courtyards thereby connecting the "string of pearls" together.
7. Village Green:
   - 50 x 60 open play turf area
   - Community garden
   - Picnic shade structure w/BBQ
   - Large tot lot
8. Semi-Private courtyard:
   - Lushy landscape
   - BBQ and/or seating nodes provided
9. Secondary Gated Entry with Decorative Paving
10. Outdoor Lounge:
    - Decorative patio partially enclosed with low walls
    - Central outdoor kitchen with bar counter seating under shade structure
    - Fire pit
11. Green Paseo:
    - Open turf play area acts as an extension of the pedestrian promenade
    - Young children climbing sculpture/toys located in center
12. Dog Park:
    - Enclosed area
    - Dog washing station
13. 15' Wide Decomposed Granite Easement Access Drive
14. Pine Tree Urban Forest For Screen From Freeway
15. Existing Berm Along Freeway Frontage
16. 38' Wide Flood Control Eastern

Source(s): Architects Orange (09-26-14)

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Figure 5-13

CONCEPTUAL LANDSCAPE PLAN

4. Proposed Circulation Improvements

As shown on Figure 5-11, circulation facilities are planned for SDP31416. Figure 5-14, *Roadway Cross-Sections*, depicts the right-of-way widths associated with each of the various roadways. As shown on Figure 5-14, site adjacent roadway improvements are planned for 68th Street and for Pats Ranch Road. A description of each of the site adjacent roadway improvements planned as part of the Project is provided below.

- **Pats Ranch Road.** Pats Ranch Road is a north-south oriented roadway located along the Project site's eastern boundary. Pats Ranch Road is not a General Plan roadway; however, under existing conditions, it is currently constructed to its ultimate roadway width as a four-lane divided roadway. The only roadway improvements proposed along Pats Ranch Road would be striping needs at the Project site access points.
-
- **68th Street.** 68th Street is an east-west oriented roadway located along the Project site's southern boundary. As part of the Project, 68th Street would be constructed from the Project's western boundary to Pats Ranch Road at its ultimate half section width as a Major Highway (118-foot right-of-way) in compliance with City of Jurupa Valley standards.

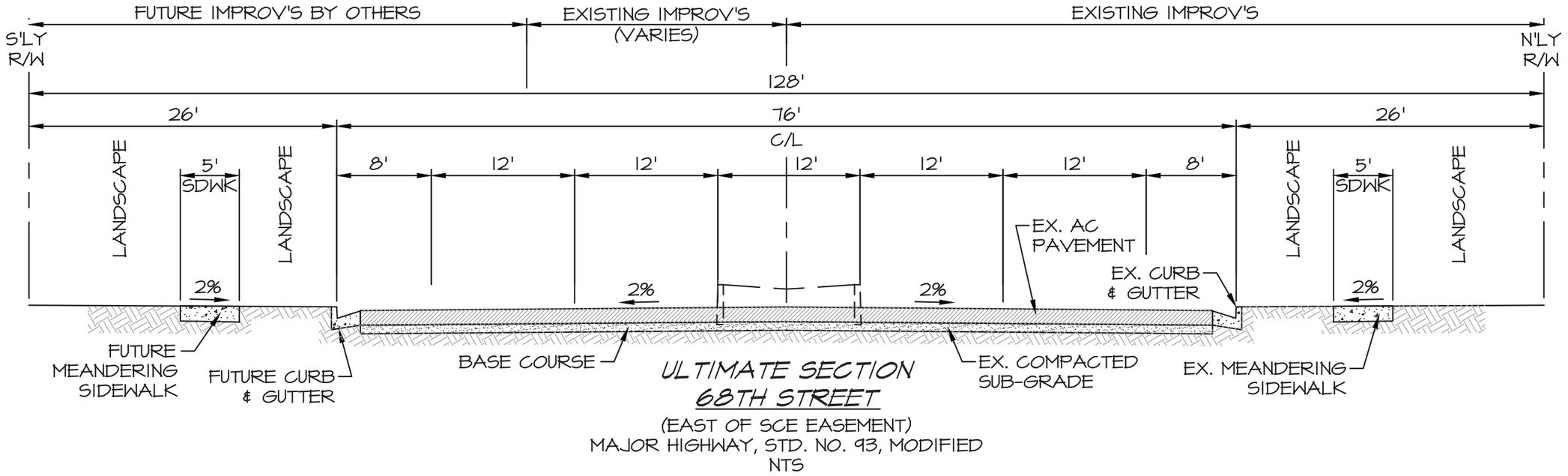
A description of the site access improvements planned as part of the Project is provided below.

- **Pats Ranch Road at Driveway 1**. Site access improvements are proposed at the intersection of Pats Ranch Road and proposed Driveway 1 (located near the northern Project boundary along Pats Ranch Road). Site access improvements to this intersection include the installation of a stop sign on the eastbound approach and the construction of a right-in/right-out driveway comprised of the following.

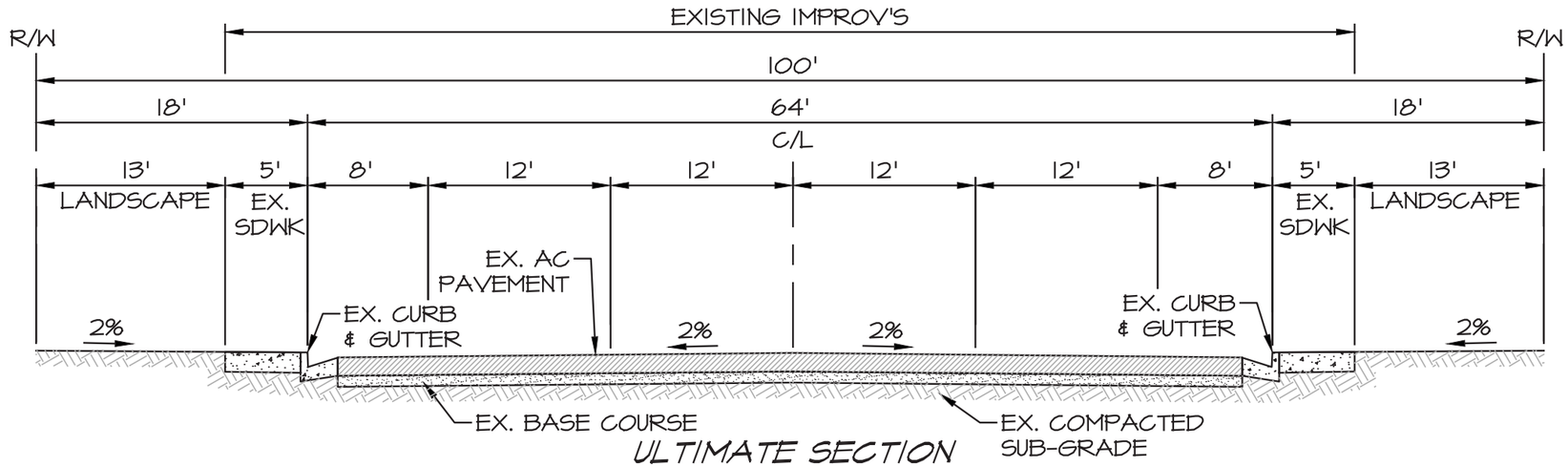
    - Construction of a northbound approach to provide two through lanes.
    - Construction of a southbound approach to provide one through lane and one shared through right turn lane.
    - Construction of an eastbound approach to provide one right turn lane.

- **Pats Ranch Road at Ivory Street**. This site access driveway is proposed to align with the existing Ivory Street which intersects with Pats Ranch Road opposite the Project site. Site access improvements at this intersection include a stop sign on the eastbound approach and the construction of the intersection as follows.

    - Construction of a northbound approach to provide one left turn lane, one through lane, and one shared through right turn lane.
    - Construction of a southbound approach to provide one left turn lane, one through lane, and one shared through right turn lane.
    - Construction of an eastbound approach to provide one shared left through right turn lane.
    - Construction of a westbound approach to provide one shared left through lane and a defacto right turn lane.



ULTIMATE SECTION
68TH STREET
(EAST OF SCE EASEMENT)
MAJOR HIGHWAY, STD. NO. 93, MODIFIED
NTS



ULTIMATE SECTION
PATS RANCH ROAD
SECONDARY HIGHWAY, STD. NO. 94
NTS

Source(s): Webb Associates (12-17-14)

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Figure 5-14

ROADWAY CROSS-SECTIONS

- **Entry Gates**. An entry gate is proposed to be constructed at the site access driveway proposed to align with the existing Ivory Street which intersects with Pats Ranch Road opposite the Project site. A secondary entry gate is proposed at the intersection of Pats Ranch Road and proposed Driveway 1 (located near the northern Project boundary along Pats Ranch Road).

5. Proposed Non-Vehicular Circulation Improvements

The Project would construct curb and gutter and sidewalk improvements along the Project's 68th Street frontage. These improvements are already in place along the Pats Ranch Road frontage. Crosswalks would be provided at the future signalized intersection of Pats Ranch Road and 68th Street.

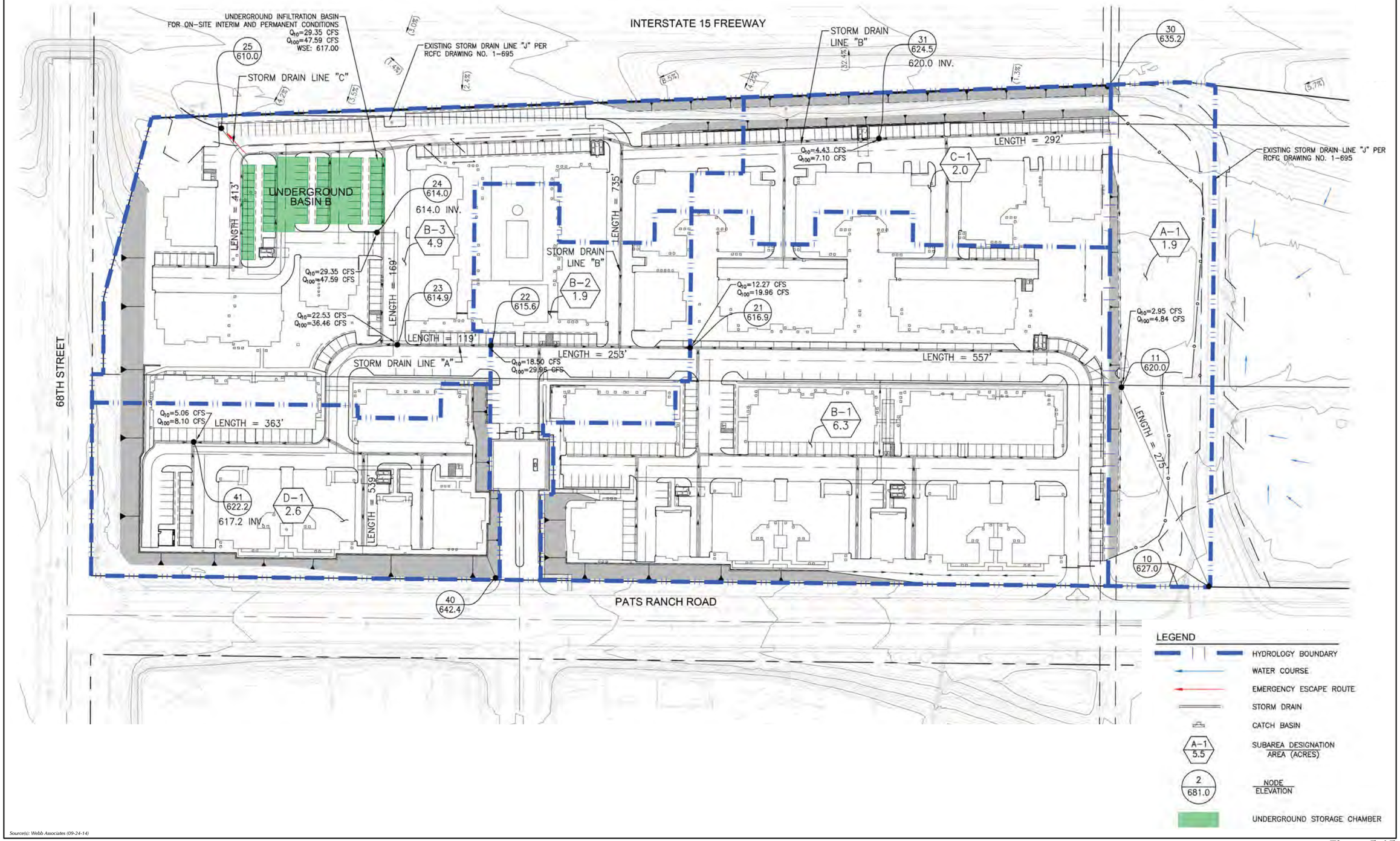
6. Proposed Drainage and Water Quality Improvements

The Project site's existing north to south drainage pattern would be generally maintained under proposed conditions but with the use of an underground pipe network. The undeveloped offsite tributary area located between the Project site's northern boundary and the existing Line "J" storm drain easement would be conveyed across the Project site via storm drain Line "A" as depicted on Figure 5-15, *Proposed On-Site Hydrology Conditions*. Onsite storm runoff would be collected by surface flow in a 4-foot wide V-gutter and conveyed along the main access road of the apartment community. As indicated on Figure 5-14, the storm runoff collected by surface flow would drop into storm drain lines "A" and "B" and be discharged into an underground water quality infiltration basin proposed on the southwesterly portion of the Project site. Intermittent grate inlets would be provided along the V-gutter (Webb Associates, 2014, p. Section 1). As shown on Figure 5-16, *Conceptual Utility Plan,* a 36-inch diameter storm drain line is proposed to connect with an existing 12-foot by 6-foot Reinforced Concrete Box (RCB) near the southwest corner of the Project site. First flush storm flows would discharge into the RCB.

7. Proposed Water Service Improvements

Water service would be provided to the Project by the Jurupa Community Services District (JCSD). Under existing conditions, water service is available from an existing 18-inch diameter water line in Pats Ranch Road east of the Project boundary (JCSD, 2014). As shown on Figure 5-16, *Conceptual Utility Plan*, 8-inch diameter water lines would be installed on the site. These water lines would provide two connections to the existing 18-inch diameter water line in Pats Ranch Road and would provide onsite domestic water, irrigation water, and water for fire protection services. For a second supply connection, the JCSD requires that approximately 500 linear feet of offsite water lines be constructed across I-15 to connect to another existing 18-inch diameter water line in 68th Street west of I-15. Additionally, each existing line would need to be interconnected by completing the loop in 68th Street south of the Project boundary. (JCSD, 2014) This line is a JCSD master planned line and the Project Applicant would be eligible for JCSD fee credit for its installation.

Located to the south of 68th Street is vacant land formerly used for agricultural purposes that is approved for the future development of single-family homes and a neighborhood park site (i.e., the "Riverbend" project, approved by City of Jurupa Valley Resolution 2013-29 on October 17, 2013).



Source(s): Webb Associates (09-24-14)

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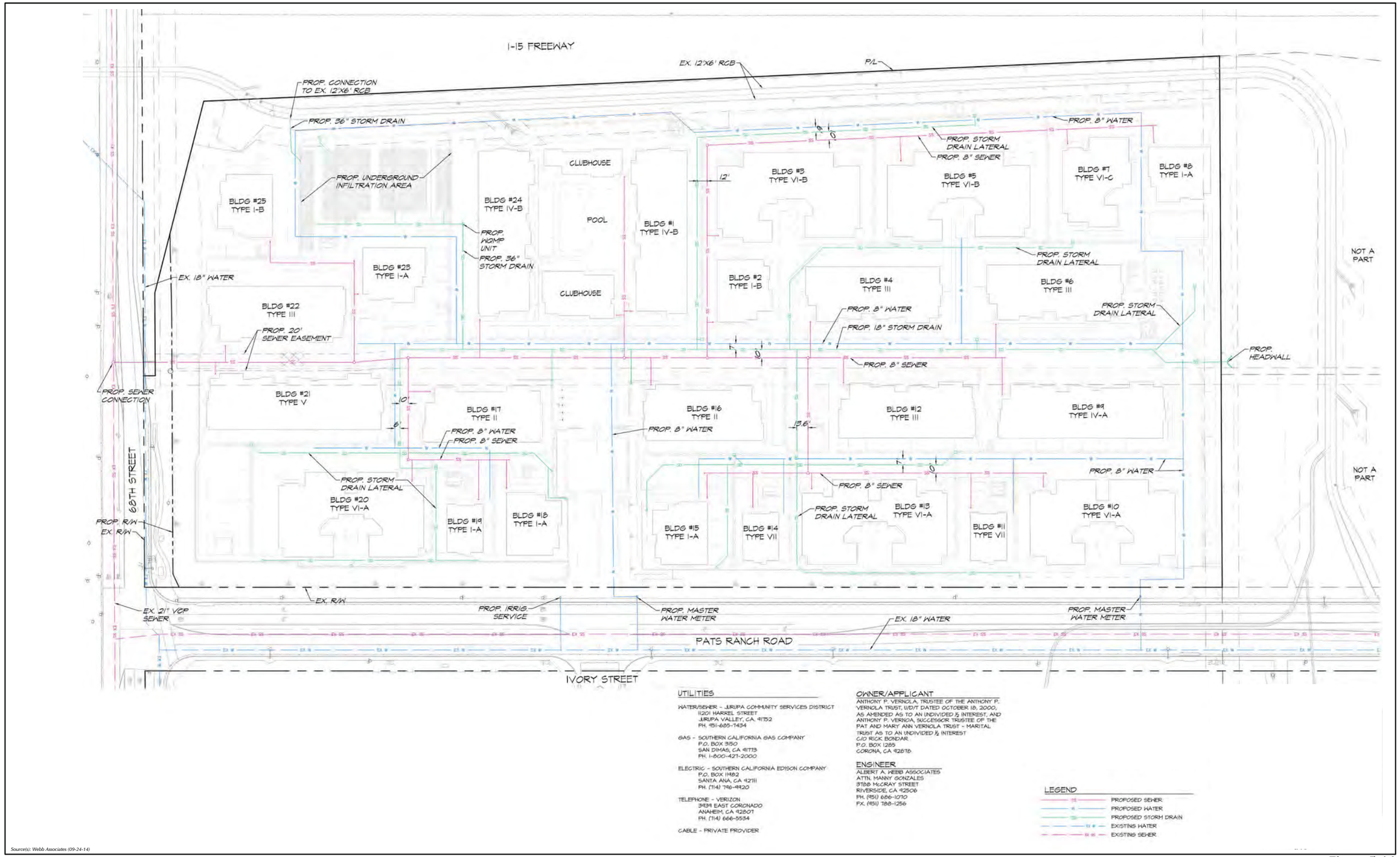
Figure 5-15

PROPOSED ON-SITE HYDROLOGY CONDITIONS



UTILITIES

WATER/SEWER – JURUPA COMMUNITY SERVICES DISTRICT
11201 HARREL STREET
JURUPA VALLEY, CA. 91752
PH. (951)-685-7434

GAS – SOUTHERN CALIFORNIA GAS COMPANY
P.O. BOX 3150
SAN DIMAS, CA 91773
PH. 1-800-427-2000

ELECTRIC – SOUTHERN CALIFORNIA EDISON COMPANY
P.O. BOX 1982
SANTA ANA, CA 92711
PH. (714) 796-4920

TELEPHONE – VERIZON
31439 EAST CORONADO
ANAHEIM, CA 92807
PH. (714) 666-5584

CABLE – PRIVATE PROVIDER

OWNER/APPLICANT

ANTHONY P. VERNOLA, TRUSTEE OF THE ANTHONY P. VERNOLA TRUST, U/D/T DATED OCTOBER 18, 2000, AS AMENDED AS TO AN UNDIVIDED ½ INTEREST, AND ANTHONY P. VERNOA, SUCCESSOR TRUSTEE OF THE PAT AND MARY ANN VERNOLA TRUST - MARITAL TRUST AS TO AN UNDIVIDED ½ INTEREST
C/O RICK BONDAR
P.O. BOX 1285
CORONA, CA 92878

ENGINEER

ALBERT A. WEBB ASSOCIATES
ATTN: MANNY GONZALES
3788 McCRAY STREET
RIVERSIDE, CA 92506
PH. (951) 686-1070
FX. (951) 788-1256

LEGEND

- PROPOSED SEWER
- PROPOSED WATER
- PROPOSED STORM DRAIN
- EXISTING WATER
- EXISTING SEWER

Source(s): Webb Associates (09-24-14)

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Figure 5-16

CONCEPTUAL UTILITY PLAN

The "Riverbend" Project was conditioned to construct 500 linear feet of water line beneath 68th Street to connect with an existing 18-inch line on the west side of I-15, to serve as a second supply connection for its development. If the proposed Project proceeds prior to the "Riverbend" development, the proposed Project would be required to install the approximately 500 linear feet of offsite water lines across I-15 to connect to another existing 18-inch diameter water line in 68th Street west of I-15. On the other hand, if the "Riverbend" project occurs first, the proposed Project would not be required to install the approximately 500 linear feet of offsite water lines across I-15 to connect to another existing 18-inch diameter water line in 68th Street west of I-15.

8. Proposed Sewer Service Improvements

Sanitary sewer service to the Project site would be provided by the JCSD. Sewer service would be provided to the site from an existing 21-inch diameter sewer line in 68th Street south of the Project boundary. (JCSD, 2014) As indicted on Figure 5-16, 8-inch diameter sewer lines would be installed onsite that would connect to the existing sewer line in 68th Street.

B. Construction Characteristics

1. Earthwork and Grading

Earthwork and grading details are based on SDP31416. The grading concept proposes 125,900 cubic yards (CY) of cut and 118,000 CY of fill resulting in a total export of 7,800 CY. The excess dirt would be pushed off-site to the adjacent property to the north of the Project site which also is owned by the Project Applicant. The area identified to receive exported soil from the Project site is highlighted on Figure 5-17, *Off-Site Export Area*. The identified disposal area would be contour graded between the northern property line and an existing RCFCWCD storm drain easement in a manner that would perpetuate the existing drainage pattern. The offsite area would be graded with approximately 5.5 feet of fill. Permanent erosion control measures would consist of slopes graded at or less than 3:1, the use of soil binders, and/or hydroseeding with native plants and vegetation. (Ardery, 2014)

2. Anticipated Construction Schedule

Construction activities are expected to commence in June 2015 and last through November 2016 (Urban Crossroads, 2014a, p. 21). Construction of the Project would occur in several general phases including grading, building construction, application of architectural coatings, and paving. The time durations would be somewhat sequential but would overlap in some cases. The anticipated duration of construction activities are identified in Table 5-2, *Anticipated Duration of Construction Activities.*

3. Construction Equipment

Table 5-3, *Anticipated Construction Equipment*, indicates the major construction equipment that the Project Applicant anticipates the construction contractor(s) would use during each phase of Project construction.

Table 5-2 Anticipated Duration of Construction Activities

Phase	Duration (working days)
Grading	30
Building Construction	300
Architectural Coatings	306
Paving	35

Source: Urban Crossroads, 2014a, Table 3-2, Construction Duration

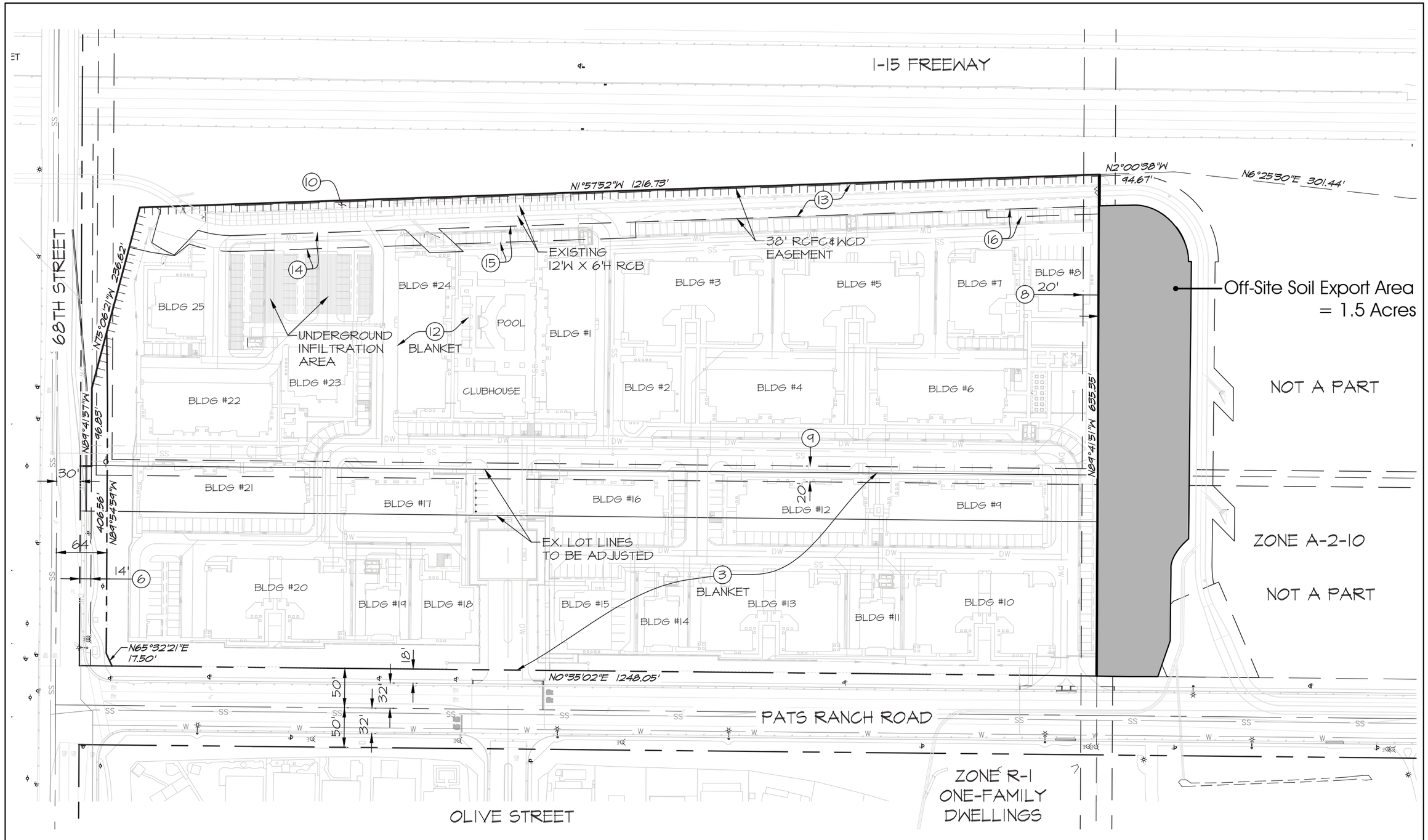
4. Anticipated Construction Employees

The Project Applicant anticipates that over the course of the proposed Project's construction duration, approximately thirty-six (36) construction workers would be present on the Project site on any given day during the various phases of construction activities. In addition, vendors delivering construction materials would travel to and from the property, at a rate of approximately 12 trips/day. (Urban Crossroads, 2014e, p. 46)

Table 5-3 Anticipated Construction Equipment

Activity	Equipment	Number	Hours Per Day
Grading	Excavators	2	8
	Graders	1	8
	Water Trucks	1	8
	Rubber Tired Dozers	1	8
	Scrapers	2	8
	Tractors/Loaders/Backhoes	2	8
Building Construction	Cranes	1	8
	Forklifts	3	8
	Generator Sets	1	8
	Tractors/Loaders/Backhoes	3	8
	Welders	1	8
Architectural Coatings	Air Compressors	1	8
Paving	Pavers	2	8
	Paving Equipment	2	8
	Rollers	2	8

Source: Urban Crossroads, 2014a, Table 3-3, Construction Equipment Assumptions



Source(s): Webb Associates (12-17-14)

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Figure 5-17

OFF-SITE EXPORT AREA

C. Operational Characteristics

The proposed Project would be operated as a residential apartment community. As such, typical operational characteristics include residents and visitors traveling to and from the apartments and associated amenities, leisure, and maintenance activities occurring within the apartment community.

1. Future Population

The Project would develop the subject property with 397 apartment units. The California, Department of Finance, Table E-5 Population and Housing Estimates for Cities, Counties, and the State- January 1, 2011-2014 lists persons per household as 3.88 for the City of Jurupa Valley (California Department of Finance, 2014). Therefore, applying that household size factor, the proposed Project would increase the City of Jurupa Valley's population by up to approximately 1,540 (397 x 3.88=1,540.36) new residents. This represents an increase of up to 1,540 new residents as compared to zero residents that would have been generated on the property if the site were built under its current General Plan land use designation of Light Industrial (LI).

2. Future Traffic

Traffic would be generated by the residents of the 397 apartment units planned for the site. The Project Trip Generation summary prepared by Urban Crossroads in the Project-specific Traffic Impact Analysis (see Technical Appendix J) indicates that implementation of the proposed Project would result in the generation of approximately 2,640 daily trip-ends per day, with an estimated 202 weekday trips in the AM peak hours and 246 weekday PM peak hour trips. (Urban Crossroads, 2014e, Table 4-1).

6.0 Evaluation of Environmental Impacts

6.0 EVALUATION OF ENVIRONMENTAL IMPACTS

In accordance with the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000-21178.1), this Initial Study has been prepared to analyze the proposed Project to determine any potential significant impacts upon the environment that could result from construction and implementation of the Project. In accordance with California Code of Regulations, Section 15063, this Initial Study is a preliminary analysis prepared by the Lead Agency, the City of Jurupa Valley, in consultation with other jurisdictional agencies, to determine whether a Negative Declaration, Mitigated Negative Declaration, or an Environmental Impact Report is required for the proposed project. The purpose of this Initial Study is to inform the decision-makers, affected agencies, and the public of potential environmental impacts associated with the implementation of the proposed Project.

The environmental subject areas evaluated herein are listed below. Each section evaluates several specific subject matters related to the general topic of the subsection. The title of each subsection is not limiting; therefore, refer to each subsection for a full account of the subject matters addressed therein.

6.1 AESTHETICS

Would the project:	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
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, which would adversely affect day or nighttime views in the area?		✓		

Impact Analysis

6.1(a). Have a substantial adverse effect on a scenic vista?

Finding: Less-than-Significant Impact

(Sources: City of Jurupa Valley General Plan, Circulation Element & Multipurpose Open Space Element; Eastvale Area Plan; Jurupa Valley Area Plan; Google Earth; Project Application Materials; Site Field Survey, 2014)

The Project site is located in the City of Jurupa Valley, which lies within a relatively flat valley floor surrounded by rugged hills and mountains at a distance to the north, west, and east. North of State Route 60 and approximately 5.5 miles northeast of the Project site is the Jurupa Mountains. Mount Jurupa, the highest point of the Jurupa Mountains, has an elevation of approximately 2,217 feet and is about 7 miles from the northeast corner of the Project site. Further north and approximately 12 miles north of the Project site is the base of the San Gabriel Mountains. The Pedley Hills are lower in elevation, located less than 4 miles from the northeast of the Project site. Approximately 1.1 miles and 2.4 miles southeast of the Project is the base of the La Sierra Hills and Norco Hills, respectively. Although atmospheric haze often obscures clear views, distant views of the San Gabriel Mountains are visible from the adjacent I-15 Freeway, 68th Street, the Project site and Pats Ranch Road, looking north. Long distance views of the mountains are available to motorists for brief moments of time (seconds), while driving at varying speeds. None of these three travel routes are designated as a Scenic Highway or some sort of scenic corridor to recognize and protect scenic views. La Sierra and Norco Hills are visible from the Project site and 68th Street, looking southeast. Approximately one-half mile to the south of the Project site is the Santa Ana River, which is also the southern boundary of the City of Jurupa Valley. The river is described as a unique and significant visual resource by the Eastvale Area Plan, although because the river sits at a low elevation, its

visibility is limited other than from properies that sit at a higher elevation and offer unobstructed views toward the river corridor. Views of the river from 68th Street and Pats Ranch Road adjacent to the Project site are not present under existing conditions because there is not enough topographic elevation change to afford a view.

The Project site consists of disturbed, relatively flat, vacant land, and stockpiles of dirt mixed with debris. The open character of the Project site does not contribute to a scenic vista defined by the City's General Plan or any other planning document. The receiving site for the Project's earth material export is the parcel immediately to the north, which is also vacant and does not contribute to a scenic vista.

As mentioned previously, distant landforms visible or periodically visible on clear days from the Project's vicinity include the San Gabriel Mountains about 12 miles to the north, the Jurupa Mountains 5 miles to the northeast, the Pedley Hills 4 miles to the northeast, the La Sierra Hills 1.1 miles to the southeast, and the Norco Hills 2.4 miles to the southeast. According to the Site Development Plan included as part of the Project's application materials on file with the City of Jurupa Valley, the proposed apartment buildings would be constructed as three-story structures, with a maximum height of 43' 5". Furthermore, pursuant to the land use regulations contained within the City's Zoning Ordinance, the proposed R-3 zoning designation would apply a maximum height limit of 50 feet for all structures on-site. The three-story structures proposed throughout the site would partially block but would not completely obstruct views from surrounding public roadways to the hills and mountains visible in the horizon under existing conditions. This would be a less than significant impact, because the mountain views to the north are extremely long distance, usually obscured by haze, and are available for momentary glimpses to passing motorists. The mobile viewing experience is not considered significant; therefore, partial obstruction of these views by the proposed apartment complex structures would have a less than significant aesthetic impact. A proposed six (6) foot high community theme wall is proposed along the site's shared boundary with 68th Street and a proposed 12 foot high noise barrier is proposed along the Project site's frontage with I-15, which would block views from the freeway to the visual foreground of the Project site. There are no scenic features on site; therefore, blocking foreground views of the site from the freeway would result in a less than significant impact. The receiving site for the Project's earth material export would be raised in elevation by up to 5.5 feet but would not contain any vertical structures and has no potential to impact scenic vistas. Implementation of the proposed Project would result in a less-than-significant impact on scenic vistas.

6.1(b). Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Finding: No Impact

(*Sources: California Scenic Highway Program Eligible and Designated Routes, n.d.; City of Jurupa Valley General Plan, Figure C-9 - Riverside County Scenic Highways; Google Earth)*

The proposed Project site and the adjacent receiving site for exported earth materials are not located within or adjacent to a scenic highway corridor. The nearest State-eligible scenic highway is State Route (SR) 91, which is located approximately 5.5 miles south of the Project site.

Intervening development blocks views of the Project site from SR-91. Additionally, there are no trees, rock outcroppings, historic buildings or other kinds of scenic resources located on the vacant Project site or earth materials receiving site. Therefore, the proposed Project has no potential to damage scenic resources within a state scenic highway. No impact would occur.

6.1(c). Substantially degrade the existing visual character or quality of the site and its surroundings?

Finding: Less-than-Significant Impact

(Sources: Project Application Materials; Google Earth)

The Project site consists of vacant, disturbed land and soil stockpiles, with scattered patches of weedy vegetation. The area surrounding the Project site, as described previously in Subsection 4.0, is characterized by contemporary residential subdivisions to the east and northeast, similar vacant land immediately north (the Project's proposed earth materials receiving site), then a developed retail center to the north and extending to Limonite Avenue. This area is supported by a developed street and highway system including Interstate 15 that abuts the Project site to the west. To the south is undeveloped land leading to the Santa Ana River corridor, beyond which are developed lands in the City of Norco. The undeveloped land to the south is approved for the development of a master planned residential community ("Riverbend").

With implementation of the proposed Project, the visual character of the Project site would be converted from a scene of open, vacant land to an apartment community of numerous three-story buildings, carports, landscape and open space amenities. The receiving site for the Project's earth material export is the parcel immediately to the north, which is currently vacant and would remain vacant but raised in elevation by up to 5.5 feet as a result of receiving the imported earth material.

As part of the Project's entitlement applications, the Project Applicant submitted a Site Development Plan to the City of Jurupa Valley, which would be enforced by City conditions of approval placed on the Project. According to the proposed Development Plan, the primary aesthetic theme for the proposed Project would be 'contemporary' with Spanish accents (refer to Figure 5-12, *Conceptual Architecture)*. The Development Plan also specifies concepts for architectural styles, exterior colors and materials, garage and roof design, lot layouts, unit mixes, landscaping, and other design features.

During the Project's temporary construction period, construction equipment, supplies, and activities would be visible on the subject property, and to a lesser extent the parcel to the immediate north, from immediately surrounding areas. The major construction equipment expected to be used is described in Subsection 5.3.1.5, *Construction Characteristics*. This equipment has a similar character to the heavy agricultural equipment (e.g., tractors) that operated on the Project site under past conditions. Construction activities are a common occurrence in the developing Inland Empire region of southern California and are not considered to substantially degrade the area's visual quality. All construction equipment would be removed from the Project site following completion of the Project's construction activities. For these reasons, the temporary visibility of construction equipment and activities at the Project site and on the parcel to the

immediate north would not substantially degrade the visual character of the surrounding area. Visual character changes associated with construction would be less-than-significant.

At buildout of the proposed Project, views of the site from the surrounding area would change from disturbed, vacant land to a developed apartment community. The Project site has been planned for light industrial uses by the prevailing General Plan since at least 2003 and the proposed apartment community contains open space elements and frequent building separations that would likely not occur within a light industrial development. The modern architectural styles, muted earthtone colors, concrete roof tiles, stucco finishes and extensive interior and perimeter landscape treatments would be compatible with the visual character of the neighboring single-family communities to the east. The 13-foot-deep landscape setback along the Project site's Pats Ranch Road frontage would mirror the landscape treatment on the opposite side of this street. The 26 foot-deep landscape setback along 68th Street would include a meandering sidewalk that would fill in an existing gap in this pedestrian route along the north side of 68th Street. Numerous street trees are proposed along both street frontages, and the proposed landscape elements along these frontages would provide attractive edge along the eastern and southern sides of the Project site. These aesthetic changes throughout the site would be noticeable, however, these changes would be visually compatible with the character and quality of the existing residential community to the east and would not be considered to be degrading. The proposed Project would also be of comparable character and quality as the existing homes on the opposite side of I-15 in the City of Eastvale and the homes planned in the Riverbend development on the south side of 68th Street. The parcel to the immediate north of the Project site would be raised in elevation by up to 5.5 feet as a result of receiving earth materials, but the disturbed areas are proposed to be covered with soil binders and/or a hydroseed mix of native plants, resulting in an appearance not noticeably different than the property's existing vacant condition.

For all of the reasons stated above, implementation of the proposed Project would not degrade the existing visual character or quality of the site and its surroundings. Impacts would be less than significant.

6.1(d). Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?

Finding: Less-than-Significant with Mitigation Incorporated

(Sources: Ordinance No. 461; Project Application Materials)

No sources of artificial light are located on the property under the existing vacant site conditions. Implementation of the proposed Project would include the installation of exterior lighting fixtures throughout the site that are typical of an apartment community. Exterior nighttime lighting fixtures would primarily include street lights, lights installed on individual buildings and in parking areas, and lights associated with the proposed on-site pool and clubhouse area. As a result, the Project would increase the amount of artificial nighttime light emitted in the area, incrementally contributing to a reduction of nighttime, dark-sky views. Under existing conditions, however, the property does not have dark sky views because the Project site is surrounded by suburban development to the north and west, rural residential development to the northeast, and I-15 to the

immediate west, all of which emit light. As such, the addition of exterior lighting fixtures in Project's development area would not constitute in a substantial new source of artificial light.

Even though the Project's exterior lighting would not be a substantial new source of light, exterior lighting fixtures installed on the property have the potential to result in adverse nighttime light and glare effects associated with off-site light trespass. Potential impacts would be reduced to less than significant, through compliance with City of Jurupa Valley Design Guidelines, Section II.H, outdoor lighting, other than street lighting, shall be low to the ground or shielded and hooded to avoid shining onto adjacent properties and streets. Mitigation Measure AE-1 is imposed to ensure compliance with Ordinance 915. Street lights are required to comply with design standards contained within City Ordinance No. 461 (Road Improvement Standards & Specifications) which establishes minimum design standards for street lights to ensure public safety and minimize public nuisance and would ensure that adverse effects associated with light trespass and/or glare would not occur. Mitigation Measure AE-2 is imposed to ensure compliance with City Ordinance No. 461.

Mitigation

> **Mitigation Measure AE-1:** Prior to residential building permit issuance, the City shall review construction drawings to ensure that proposed exterior, artificial lighting is in compliance with City of Jurupa Valley Design Guidelines, Section II.H, outdoor lighting, other than street lighting, shall be low to the ground or shielded and hooded to avoid shining onto adjacent properties and streets. Project contractors shall be required to comply with the construction drawings and permit periodic inspection of the construction site by City of Jurupa Valley staff or its designee to confirm compliance.
>
> **Mitigation Measure AE-2:** Street lights shall comply with design standards contained within City Ordinance No. 461 (Road Improvement Standards & Specifications) which specify that street luminaires shall be full cut off.

With implementation of Mitigation Measures AE-1 and AE-2, the Project's potential impact associated with off-site light and glare trespass would be reduced to below a level of significance.

6.2 AGRICULTURE AND FORESTRY RESOURCES

Would the project:	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
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?				✓

Impact Analysis

6.2(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?

Finding: No Impact

(Sources: California Department of Conservation (CDC), Important Farmlands Map, 2010; City of Jurupa Valley General Plan, Multipurpose Open Space Element; Ordinance No. 625)

The State of California Department of Conservation Farmland Mapping and Monitoring Program (FMMP) classifies the Project site as "Farmland of Local Importance" and "Other Land. The Project site does not contain any lands designated Prime Farmland, Unique Farmland, or Farmland of Statewide Importance ("Farmland") as mapped by the FMMP. No properties abutting the Project site are classified as Farmland. Therefore, the proposed Project would not result in the conversion of any Farmland to non-agricultural use, and no impact would occur. (CDC, 2010)

Mitigation

No mitigation is required.

6.2(b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

Finding: No Impact

(Sources: City of Jurupa Valley General Plan Land Use Map, 2011; City of Jurupa Valley Zoning Map, 2011; Riverside County Land Information System (RCLIS); Riverside County General Plan Program Environmental Impact Report, 2003; CDC, Williamson Act Map, FY '08 – '09)

The Project site is zoned Industrial Park (IP). The Project's proposed Change of Zone (CZ1405) seeks to change the IP zoning to General Residential (R-3). No lands on the Project site are zoned or within close proximity to the site are zoned or proposed to be zoned for agricultural use. The Project site is not identified by the Riverside County Land Information System (RCLIS) as property that is located within an agricultural preserve. (RCLIS, 2014) In addition, the Project site is not identified by the State of California Department of Conservation as land under a Williamson Act Contract. Thus, the proposed Project would not conflict with existing zoning for agricultural use and would not conflict with a Williamson Act contract. (CDC, FY '08 - '09) No impact would occur.

Mitigation

No mitigation is required.

6.2(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))?

Finding: No Impact

(Sources: City of Jurupa Valley General Plan Land Use Map, 2011; City of Jurupa Valley Zoning Map, 2011)

The Project site is currently zoned Industrial Park (IP). The Project's proposed Change of Zone (CZ1405) seeks to change the IP zoning to General Residential (R-3). The Project site does not contain any forest lands, timberland, or timberland zoned Timberland Production lands, nor are any forest lands or timberlands located on or nearby the Project site. Because no lands on the Project site are zoned for forestland or timberland, the Project has no potential to impact such zoning. No impact would occur.

Mitigation

No mitigation is required.

6.2(d) Result in the loss of forest land or conversion of forest land to non-forest use?

Finding: No impact

(Sources: Biological Technical Report, 2014)

According to a biological field survey conducted on the Project site (refer to *Technical Appendix B*, *Biological Technical Report*) portions of the property are unvegetated and other portions are vegetated with non-native ruderal species. The Project site and surrounding properties do not contain forest lands, are not zoned for forest lands, nor are they identified as containing forest resources by the City of Jurupa Valley or adjacent City of Eastvale General Plans. Because forest land is not present on the Project site or in the immediate vicinity of the Project site, the proposed Project has no potential to result in the loss of forest land or the conversion of forest land to non-forest use. No impact would occur.

Mitigation

No mitigation is required.

6.2(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?

Finding: No Impact

(Sources: City of Jurupa Valley General Plan, Multipurpose Open Space Element; Riverside County General Plan Program Environmental Impact Report, 2003, Chapter 4.2 – Land Use/Agricultural Resources; Google Earth)

The Farmland Mapping and Monitoring Program classifies the Project property as "Farmland of Local Importance." Farmland of Local Importance is land of importance to the local economy, as defined by each county's local advisory committee and adopted by its Board of Supervisors. Farmland of Local Importance is either currently producing, or has the capability of production, but does not meet the criteria of Prime Farmland, Farmland of Statewide Importance, or Unique Farmland. According to a biological field survey conducted on the Project site (refer to *Technical Appendix B*, *Biological Technical Report*) portions of the property are unvegetated and other portions are vegetated with non-native ruderal species. The Project site is not being used for farming.

Lands surrounding the Project site include vacant undeveloped land to the immediate north (the Project's proposed earth materials receiving site), beyond which is commercial development. The Project site is bounded on the south by 68th Street. Located to the south of 68th Street is agricultural land that is approved for the future development of 464 single-family residential homes and a neighborhood park site (i.e., the "Riverbend" project). Because the Riverbend project has already been approved by the City of Jurupa Valley for future residential development, implementation of the proposed Project would not expedite the conversion of that land to non-agricultural use. The Project site is bounded on the east by Pats Ranch Road. Located to the east of Pats Ranch Road are single-family detached homes. To the east of the single-family detached homes is Louis

Vandermolen Fundamental Elementary School. To the west of the Project site is I-15. Located east of I-15 are single-family detached homes that are located in the City of Eastvale. Given the absence of farmland or forest land and the developed character of surrounding lands, the proposed Project would have no potential to convert farmland to non-agricultural use or forest land to non-forest use. No impact would occur.

Mitigation

No mitigation is required.

6.3 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:***	**Potentially Significant Impact**	**Less Than Significant Impact With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
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 non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?			✓	
d. Expose sensitive receptors to substantial pollutant concentrations?			✓	
e. Create objectionable odors affecting a substantial number of people?			✓	

Impact Analysis

6.3(a) Conflict with or obstruct implementation of the applicable air quality plan?

Finding: Less-than-Significant Impact

(Sources: Air Quality Impact Analysis, 2014; South Coast Air Quality Management District Final 2012 Air Quality Management Plan, 2012; CEQA Air Quality Handbook; Project Application Materials; Trip Generation Manual, 9th Edition, 2012.)

The Project site is located within the South Coast Air Basin (SCAB or "Basin"). The SCAB encompasses approximately 6,745 square miles and includes Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties. The SCAB is bound by the Pacific Ocean to the west; the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east, respectively; and the San Diego County line to the south. The South Coast Air Quality Management District (SCAQMD) works directly with the Southern California Association of Governments (SCAG), county transportation commissions, local governments, and state and federal agencies to reduce emissions from stationary, mobile, and indirect sources to meet state and federal ambient air quality standards.

The SCAQMD has adopted a series of Air Quality Management Plans (AQMPs) to reduce air emissions in the Basin. SCAQMD adopted the 2012 AQMP on December 7, 2012. The Final 2012 AQMP incorporates the latest scientific and technological information and planning assumptions,

including the 2012 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) prepared by the Southern California Association of Governments (SCAG) and updated emission inventory methodologies for various source categories. The Final 2012 AQMP is based on assumptions provided by both CARB and SCAG in the latest available EMFAC model for the most recent motor vehicle and demographics information, respectively. The Final 2012 AQMP assumes that development associated with general plans, specific plans, residential projects, and wastewater facilities will be constructed in accordance with population growth projections identified by SCAG. The SCAQMD has established criteria for determining consistency with the AQMP. These criteria are defined in Chapter 12, Sections 12.2 and 12.3 of the SCAQMD *CEQA Air Quality Handbook* and are discussed below.

Consistency Criterion No. 1: *The proposed project will not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay the timely attainment of air quality standards or the interim emissions reductions specified in the AQMP.*

Consistency Criterion No. 1 refers to violations of the California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS). As evaluated under Issues 6.3(b), (c), and (d), below, the proposed Project would not exceed regional or localized significance thresholds for any criteria pollutant during construction or long-term operation. Accordingly, the Project is determined to be consistent with the first criterion.

Consistency Criterion No. 2: *The proposed project will not exceed the assumptions in the AQMP based on the years of project build-out phase.*

The growth forecasts used in the AQMP to project future emissions levels are based on the projections of the Regional Transportation Model utilized by SCAG, which incorporates land use data provided by lead agency general plan documentation, as well as assumptions regarding population number, location of population growth, and a regional housing needs assessment. The 2012 AQMP has assumed that development associated with general plans, specific plans, residential projects, and wastewater facilities will be constructed in accordance with population growth projections identified by SCAG in its 2012 RTP, and that development projects would implement strategies to reduce emissions generated during the construction and operational phases of development. The Project applicant proposes a residential land use in an area designated for light industrial land use. With a Project site area of approximately 17.4 acres, if a 0.5 FAR is assumed for the industrial use, the site could be developed with an industrial park having approximately 378,972 square feet of building space. Using ITE trip generation rates, this would equate to approximately 2,588 vehicles per day, compared to the proposed Project's 2,640 vehicles per day.

Although on the surface it would appear that the proposed Project would generate slightly more trips than the hypothetical industrial park, it is important to note that the vehicle fleet mix would also be different. The hypothetical industrial park would generate almost 500 truck trips per day which in turn would generate more emissions than the typical passenger car for a residential occupancy, and likely equal or exceed emissions generated by additional trips

generated by the proposed Project. (Urban Crossroads, 2014a, p. 33) In addition, the Project does not exceed any of the SCAQMD numerical thresholds (regional and LST) for both construction and operation. Therefore, the Project is consistent with the AQMP emission projections for the near-term period of the project buildout. If the proposed Project is approved by the City of Jurupa Valley, the property's new General Plan designation of R3 will be included in the next update to the AQMP regional growth forecasts and related emissions forecasts.

For the reasons stated above, the proposed Project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, delay the timely attainment of air quality standards or the interim emissions reductions specified in the Final 2012 AQMP. As such, the Project would be consistent with the AQMP and impacts would be less than significant.

6.3(b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Finding: Less-than-Significant Impact

(Sources: Air Quality Impact Analysis, 2014)

The SCAQMD monitors levels of various criteria pollutants at thirty (30) monitoring stations throughout the SCAB. In 2012, the federal and State ambient air quality standards (NAAQS and CAAQS) were exceeded on one or more days for ozone (O_3), particulate matter ≤ 10 microns (PM_{10}), and particulate matter ≤ 2.5 microns ($PM_{2.5}$) at most monitoring locations. No areas of the SCAB exceeded national or state standards for nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), sulfates or lead. The most recent three (3) years of data available for air quality levels at the SCAQMD monitoring station nearest the Project site are provided in Table 2-3 of the Air Quality Impact Analysis attached as *Technical Appendix A1.*

As with any new development project, the proposed Project has the potential to generate substantial pollutant concentrations during both construction activities and long-term operation. The SCAQMD has developed regional and localized significance thresholds for regulated pollutants in order to meet national and state air quality standards. Table 6-1, *SCAQMD Regional and Localized Thresholds of Significance*, summarizes the SCAQMD's regional and localized thresholds. The SCAQMD's CEQA Air Quality Significance Thresholds (March 2009) indicate that any project in the SCAB with daily emissions that exceed any of the indicated thresholds should be considered as having an individually and cumulatively significant air quality impact. The proposed Project has the potential to exceed the SCAQMD regional and/or localized emissions thresholds during both Project construction and long-term operation. Each is discussed below.

Table 6-1 SCAQMD Regional and Localized Thresholds of Significance

Pollutant	Construction	Operations
Regional Thresholds		
NO_X	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM_{10}	150 lbs/day	150 lbs/day
$PM_{2.5}$	55 lbs/day	55 lbs/day
SO_X	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
Localized Thresholds		
NO_X	236.67 lbs/day	270 lbs/day
PM_{10}	19.93 lbs/day	6.40 lbs/day
$PM_{2.5}$	7.47 lbs/day	2.40 lbs/day
CO	1,345.67 lbs/day	1,577 lbs/day

Source: (Urban Crossroads, 2014a)

It should be noted that the analysis in this Subsection assumes that the proposed Project would comply with applicable, mandatory regulatory requirements, including: SCAQMD Rule 403, "Fugitive Dust;" SCAQMD Rule 431.2, "Sulfur Content of Liquid Fuels;" SCAQMD Rule 1113, "Architectural Coatings;" SCAQMD Rule 1186, "PM_{10} Emissions from Paved and Unpaved Roads, and Livestock Operations;" and SCAQMD Rule 1186.1, "Less-Polluting Street Sweepers."

❑ **Construction Emissions – Regional Thresholds**

Construction activities associated with the proposed Project would result in emissions of CO, VOCs, NO_X, SO_X, PM_{10}, and $PM_{2.5}$. Construction related emissions are expected from the following construction activities:

- Site Preparation
- Grading and Infrastructure Installation
- Building Construction
- Paving
- Architectural Coatings (Painting)
- Construction Workers Commuting

For purposes of analysis, it is assumed that construction of the Project would occur from June 2015 to November 2016. If construction activities actually occur at a later date than assumed in this analysis, emissions associated with construction vehicle exhaust would be less than disclosed below due to the application of more restrictive regulatory requirements for construction equipment and the ongoing replacement of older construction fleet equipment with newer, less-polluting equipment by construction contractors, as contained in the CalEEMod model.

Dust is typically a major concern during rough grading activities. Because such emissions are not amenable to collection and discharge through a controlled source, they are called "fugitive emissions." Fugitive dust emissions rates vary as a function of many parameters (soil silt, soil moisture, wind speed, area disturbed, number of vehicles, depth of disturbance or excavation, etc.). The CalEEMod model was utilized to calculate fugitive dust emissions resulting from this phase of activity. Construction emissions for construction worker vehicles traveling to and from the Project site, as well as vendor trips (construction materials delivered to the Project site) were estimated based on CalEEMod defaults. The Project's construction characteristics and construction equipment fleet assumptions used in the analysis are described in the Air Quality Impact Analysis and the Mobile Source Air Toxic and Criteria Pollutant Health Risk Assessment attached as T*echnical Appendices A1 and A2,* respectively.

The calculated maximum daily emissions associated with construction of the proposed Project are presented in Table 6-2, *Emissions Summary of Overall Construction.* As shown in Table 6-2, construction-related emissions would not exceed any criteria pollutant thresholds established by the SCAQMD. Accordingly, the Project would not emit substantial concentrations of these pollutants during construction and would not contribute to an existing or projected air quality violation on a direct or cumulative basis. Thus, impacts associated with construction-related emissions of volatile organic compounds (VOC), nitrogen oxides (NO_X), CO, sulfur oxides (SO_X), PM_{10} and $PM_{2.5}$ would be less than significant and no mitigation is required.

Table 6-2 Emissions Summary of Overall Construction

Year	Emissions (pounds per day)					
	VOC	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
2015	18.65	87.93	68.86	0.12	8.98	5.32
2016	17.99	45.16	64.35	0.12	8.76	4.07
Maximum Daily Emissions	**18.65**	**87.93**	**68.86**	**0.12**	**8.98**	**5.32**
SCAQMD Regional Threshold	75	100	550	150	150	55
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Source: Urban Crossroads, 2014a, Table 3-5.

❑ **Construction Emissions – Localized Significance Thresholds**

As previously discussed, the SCAQMD has established that impacts to air quality are significant if there is a potential to contribute or cause localized exceedances of the federal and/or state ambient air quality standards (NAAQS/CAAQS). Collectively, these are referred to as Localized Significance

Thresholds (LSTs). LSTs were developed in response to environmental justice and health concerns raised by the public regarding exposure of individuals to criteria pollutants in local communities. To address the issue of localized significance, the SCAQMD adopted LSTs that show whether a project would cause or contribute to localized air quality impacts and thereby cause or contribute to potential localized adverse health effects. The analysis makes use of methodology included in the SCAQMD Final Localized Significance Threshold Methodology (Methodology) (SCAQMD, June 2003).

The significance of localized emissions impacts depends on whether ambient levels in the vicinity of a given project are above or below State standards. In the case of CO and NO_2, if ambient levels are below the standards, a project is considered to have a significant impact if emissions result in an exceedance of one or more of these standards. If ambient levels already exceed a state or federal standard, then project emissions are considered significant if they increase ambient concentrations by a measurable amount. This would apply to PM_{10} and $PM_{2.5}$, both of which are non-attainment pollutants.

For this Project, the appropriate Source Receptor Area (SRA) for the LST analysis is SRA 23. LSTs apply to CO, NO_2, PM_{10}, and $PM_{2.5}$. SCAQMD's Methodology clearly states that "off-site mobile emissions from the Project should not be included in the emissions compared to LSTs (23)." Therefore, for purposes of the construction LST analysis only emissions included in the CalEEMod "on-site" emissions outputs were considered.

Based on the Project's anticipated construction characteristics, it is estimated that the Project could actively disturb approximately 4.0 acres per day. Refer to Mitigation Measure AQ-3 which limits grading to no more than 4.0 acres per day. The site specific construction fleet may vary due to specific project needs at the time of construction. The SCAQMD produced look-up tables for projects less than or equal to 5 acres in size; since the Project does not exceed a disturbance area of 5 acres in size, SCAQMD LST look-up tables are used to determine localized impacts consistent with SCAQMD protocol.

The nearest receptor (where an individual can stay for a shorter averaged time) is located immediately adjacent to the north of the Project site (zoned industrial). Notwithstanding, the Methodology explicitly states that "It is possible that a project may have receptors closer than 25 meters. Projects with boundaries located closer than 25 meters to the nearest receptor should use the LSTs for receptors located at 25 meters." Based on SCAQMD's Final LST Methodology, a 25 meter receptor distance is utilized in order to determine the LSTs for emissions of CO and NO_2.

The nearest sensitive receptor land use (where an individual could remain for 24 hours) is located ~115 feet/35 meters east of the Project site. For purposes of this analysis, a 35 meter sensitive receptor distance is utilized in order to determine the LSTs for emissions of PM_{10} and $PM_{2.5}$.

Assuming mandatory compliance with applicable air quality regulations, Table 6-3, *Localized Significance Summary – Construction*, presents the maximum daily emissions anticipated during construction. As shown, the Project's localized emissions of NO_X, CO, PM_{10}, and $PM_{2.5}$ during construction would not exceed the SCAQMD localized thresholds of significance. Accordingly, localized impacts during construction would be less than significant.

Table 6-3 Localized Significance Summary – Construction

On-Site Site Preparation Emissions	Emissions (pounds per day)			
	NO_x	CO	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions	**87.78**	**54.01**	**7.56**	**5.25**
SCAQMD Localized Threshold	236.67	1,345.67	19.93	7.47
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**

Source: Urban Crossroads, 2014a, Table 3-9.

- **Operational Emissions – Regional Thresholds**

The proposed Project would be operated as a residential apartment community. As such, typical operational characteristics include residents and visitors traveling to and from the apartments and associated amenities, leisure, and maintenance activities occurring on the site. Accordingly, operational emissions would be expected from the following primary sources: (1) area source emissions, (2) energy source emissions, and (3) mobile source emissions. Emissions associated with the Project's operational phase would consist of emissions of ROG, NO_X, CO, SO_X, PM_{10}, and $PM_{2.5}$.

As indicated in Table 6-4, *Summary of Peak Operational Emissions*, Project-related operational-source emissions would not exceed applicable SCAQMD regional criteria thresholds. Accordingly, the proposed Project would not emit substantial concentrations of these pollutants during long-term operation and would not contribute to an existing or projected air quality violation on a direct or cumulatively considerable basis. Thus, impacts associated with emissions of VOC, NO_X, CO, SO_X, PM_{10} and $PM_{2.5}$ would be less than significant and no mitigation is required.

- **Operational Emissions – Localized Significance Thresholds**

Table 6-5, *Localized Significance Summary – Operations*, shows the calculated emissions for the Project's operational activities compared with the applicable LSTs. The LST analysis includes on-site sources only; however, the CalEEMod™ model outputs do not separate on-site and off-site emissions from mobile sources. In an effort to establish a maximum potential impact scenario for analytic purposes, the emissions shown on Table 6-5 represent all on-site Project-related stationary (area) sources and five percent (5%) of the Project-related mobile sources. Considering that the weighted trip length used in CalEEMod™ for the Project is approximately 14.7 miles, 5% of this total would represent an on-site travel distance for each car and truck of approximately 1 mile or 5,280 feet; thus the 5% assumption is conservative and would tend to overstate the actual impact. Modeling based on these assumptions demonstrates that even within broad encompassing parameters, Project operational-source emissions would not exceed applicable LSTs.

For operational LSTs, the nearest sensitive receptor where an individual can stay for a shorter averaged time is located immediately adjacent to the north of the Project site (zoned industrial). Notwithstanding, the Methodology explicitly states that "It is possible that a project may have receptors closer than 25 meters. Projects with boundaries located closer than 25 meters to the nearest receptor should use the LSTs for receptors located at 25 meters." Based on SCAQMD's Final

LST Methodology, a 25 meter receptor distance is utilized in order to determine the LSTs for emissions of CO and NO_2.

Table 6-4 Summary of Peak Operational Emissions

Operational Activities – Summer Scenario	Emissions (pounds per day)					
	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area Source	16.88	0.39	33.33	1.74e-3	0.71	0.71
Energy Source	0.16	1.33	0.57	8.51e-3	0.11	0.11
Mobile	10.13	29.35	120.42	0.29	19.56	5.50
Maximum Daily Emissions	**27.17**	**31.07**	**154.32**	**0.30**	**20.38**	**6.32**
SCAQMD Regional Threshold	55	55	550	150	150	55
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Operational Activities – Winter Scenario	Emissions (pounds per day)					
	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area Source	16.88	0.39	33.33	1.74e-3	0.71	0.71
Energy Source	0.16	1.33	0.57	8.51e-3	0.11	0.11
Mobile	10.46	30.88	117.84	0.27	19.56	5.51
Maximum Daily Emissions	**27.50**	**32.61**	**151.74**	**0.28**	**20.38**	**6.32**
SCAQMD Regional Threshold	55	55	550	150	150	55
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Source: Urban Crossroads, 2014a, Table 3-6.

Table 6-5 Localized Significance Summary – Operations

Operational Activity	Emissions (pounds per day)			
	NO_x	CO	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions	**3.26**	**39.92**	**1.80**	**1.10**
SCAQMD Localized Threshold	270	1,577	6.40	2.40
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**

Source: Urban Crossroads, 2014a, Table 3-10.

The nearest sensitive receptor land use where an individual could remain for 24 hours is located ~115 feet/35 meters east of the Project site. For purposes of this analysis, a 35 meter sensitive receptor distance is utilized in order to determine the LSTs for emissions of PM_{10} and $PM_{2.5}$.

If emissions exceed the LST for a 5-acre site, then dispersion modeling needs to be conducted. Use of the LSTs for a 5-acre site for operational activities is appropriate since this would result in more stringent LSTs because emissions would occur in a more concentrated area and closer to the nearest sensitive receptor than in reality.

As shown on Table 6-5, operational emissions would not exceed the LST thresholds for the nearest sensitive receptor. Therefore, the Project would have a less than significant localized impact during operational activity.

- **Conclusion**

As indicated in the above analysis, less-than-significant impacts would occur based on the SCAQMD regional thresholds during construction activities or long-term operation. Additionally, near-term construction activities and long-term operation of the proposed Project would not exceed the SCAQMD LSTs. Accordingly, implementation of the proposed Project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation, and impacts would be less than significant.

Mitigation

Although Project-related construction air quality emissions would be below the SCAQMD regional and localized thresholds for all criteria pollutants, the following mitigation measures are nonetheless identified to ensure Project consistency with standard regulatory requirements and the assumptions utilized in the Project's air quality impact analysis.

Mitigation Measure AQ-1: The Project is required to comply with the provisions of South Coast Air Quality Management District Rule 403, "Fugitive Dust." Rule 403 requires implementation of best available dust control measures during construction activities that generate fugitive dust, such as earth moving and stockpiling activities, grading, and equipment travel on unpaved roads. Prior to grading permit issuance, the City shall verify that the following notes are included on grading plans and/or stockpile plans. Project contractors shall be required to ensure compliance with the notes and permit periodic inspection of the construction site by City of Jurupa Valley staff or its designee to confirm compliance. These notes also shall be specified in bid documents issued to prospective construction contractors.

a. During grading and ground-disturbing construction activities, the construction contractor shall ensure that all clearing, grading, or excavation activities shall cease when winds exceed 25 miles per hour (mph).

b. During grading and ground-disturbing construction activities, the construction contractor shall ensure that all unpaved roads and areas within the Project undergoing active ground disturbance are watered at least three (3) times daily during dry weather. Watering, with complete coverage of disturbed areas by water truck, sprinkler system or other comparable means, shall occur in the mid-morning, afternoon, and after work has been completed for the day.

c. Temporary signs shall be installed on the construction site along all unpaved roads indicating a maximum speed limit of 15 miles per hour (mph). The signs shall be installed before construction activities commence and remain in place during the duration of vehicle activities on all unpaved roads and haul routes.

Mitigation Measure AQ-2: The Project is required to comply with California Code of Regulations Title 13, Division 3, Chapter 10, Article 1, Section 2485, "Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling." Prior to grading permit issuance and building permit issuance, the City shall verify that the following notes are included on the grading and building plans. Project contractors shall be required to ensure compliance with the notes and permit periodic inspection of the construction site by City of Jurupa Valley staff or its designee to confirm compliance. These notes also shall be specified in bid documents issued to prospective construction contractors.

a. Temporary signs shall be placed on the construction site at all construction vehicle entry points and at all loading, unloading, and equipment staging areas indicating that heavy duty trucks are prohibited from idling for more than five (5) minutes at any location. The signs shall be installed before construction activities commence and remain in place during the duration of construction activities at all loading, unloading, and equipment staging areas.

Mitigation Measure AQ-3: Prior to grading permit issuance, the City shall verify that the following note is included on the grading plan. Project contractors shall be required to ensure compliance with the note and permit periodic inspection of the construction site by City of Jurupa Valley staff or its designee to confirm compliance. The note also shall be specified in bid documents issued to prospective construction contractors.

a. The construction contractor shall ensure that heavy duty construction equipment activities (i.e., crawlers, graders, bulldozers, and scrapers) do not cause more than 4.0 acres of active ground disturbance per day. The construction contractor shall maintain a written log or map of daily mass grading activities, which shall be available for City of Jurupa Valley inspection upon request

6.3(c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Finding: Less-than-Significant Impact

(Sources: Air Quality Impact Analysis, 2014)

The Project area is designated as an extreme non-attainment area for ozone and a non-attainment area for PM_{10} and $PM_{2.5.}$ Thus, pollutants of concern within the Project area include VOCs and NOx, both of which are ozone precursors, and particulate matter (PM_{10} and $PM_{2.5}$). As indicated in Table 6-2 and Table 6-4, near-term construction activities and long-term operational activities would not exceed any of the SCAQMD Regional Thresholds of Significance for VOCs, NO_X, PM_{10}, or $PM_{2.5}$. The SCAQMD's CEQA Air Quality Significance Thresholds (March 2009) indicate that any project in the SCAB with daily emissions that exceed any of the indicated thresholds should be considered as having an individually and cumulatively significant air quality impact; conversely, Projects that are

below the indicated thresholds would have a less-than-significant impact on both a direct and cumulative basis. Because the Project would not exceed the SCAQMD Regional Thresholds for any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard, impacts would be less than significant and mitigation would not be required.

6.3(d) Expose sensitive receptors to substantial pollutant concentrations?

Finding: Less-than-Significant Impact

(Sources: Air Quality Impact Analysis, 2014a; Mobile Source Air Toxic and Criteria Pollutant Health Risk Assessment, 2014b; South Coast Air Quality Management District, Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES III); South Coast Air Quality Management District "MATES III Carcinogenic Risk Interactive Map")

Sensitive receptors can include uses such as long term health care facilities, rehabilitation centers, and retirement homes. Residences, schools, playgrounds, child care centers, and athletic facilities can also be considered as sensitive receptors. The following provides an analysis of the Project's potential to expose sensitive receptors in the immediate vicinity of the Project site to substantial pollutant concentrations during Project construction and long-term operation, including existing residences located approximately 115 feet east of the Project site and east of Pats Ranch Road.

- **Construction and Operational LST Analysis**

Sensitive receptors in the immediate vicinity of the Project site, including but not limited to the existing residences located east of the Project site and east of Pats Ranch Road as described above, would be exposed to localized emissions during Project construction. As indicated above under the discussion of Issue 6.b), and as shown in Table 6-3 and Table 6-4, the proposed Project would not exceed any of the SCAQMD's Localized Significance Thresholds during near-term construction or long-term operation. Accordingly, Project-related localized emissions would not expose sensitive receptors to substantial pollutant concentrations during construction or long-term operation, and impacts would be less than significant.

- **Toxic Air Pollutant Emissions**

The SCAQMD documented existing baseline and projected basin-wide effects of toxic air contaminants in their study, titled the "Multiple Air Toxics Exposure Study in the South Coast Air Basin, MATES-III." This study shows that Project site has an estimated carcinogenic risk of 716 in one million. On the Project site, risks would be highest close to I-15. This information is presented for disclosure purposes and is not an effect caused by the proposed Project. As described above, the Project would not generate substantial stationary source emissions and would not attract or generate substantial diesel truck traffic. Accordingly, long-term operation of the Project would not emit substantial concentrations of toxic air pollutants and would not measurably or substantially increase ambient carcinogenic risk in the Project area above existing conditions.

Although CEQA requires an analysis of a project's impact on the environment and not an analysis of the environment's impact on a project, for full disclosure purposes, the City of Jurupa Valley

required an analysis of localized air quality effects on the Project site associated with the property's location, including air emissions associated with vehicular travel on the adjacent I-15 Freeway (refer to *Technical Appendix A2*).

Carcinogenic Chemical Risk

The State of California has established a threshold of one in one hundred thousand (or ten in one million) (1.0E-05) as a level posing no significant risk for exposures to carcinogens regulated under the Safe Drinking Water and Toxic Enforcement Act (Proposition 65). This threshold is also consistent with the maximum incremental cancer risk established by the SCAQMD for projects prepared under the auspices of CEQA. The SCAQMD CEQA Air Quality Handbook (1993) states that emissions of toxic air contaminants (TACs) are considered significant if a health risk assessment shows an increased risk of greater than ten in one million.

Health risks associated with exposure to carcinogenic compounds can be defined in terms of the probability of developing cancer as a result of exposure to a chemical at a given concentration. Under a deterministic approach (i.e., point estimate methodology), the cancer risk probability is determined by multiplying the chemical's annual concentration by its unit risk factor (URF). The URF is a measure of the carcinogenic potential of a chemical when a dose is received through the inhalation pathway. It represents an upper bound estimate of the probability of contracting cancer as a result of continuous exposure to an ambient concentration of one microgram per cubic meter (µg/m3) over a 70 year lifetime.

To represent residential exposures, the assessment employed the U.S. Environmental Protection Agency's guidance to develop viable dose estimates based on reasonable maximum exposures (RME). Specifically, activity patterns for population mobility recommended by the U.S. Environmental Protection Agency and presented in the Exposure Factors Handbook were utilized. As a result, lifetime risk values for residents were adjusted to account for an exposure duration of 350 days per year for 30 years (i.e., 95th percentile). A 9 year exposure duration was additionally assessed to identify risk estimates associated with the average time individuals are reported to reside at a given residence. For body weight and inhalation, the assessment employed average adult values of 70 kilograms and 20 cubic meters per day, respectively. The time frame-based exposure values are probably much higher than what will be the case with an apartment community, where residents are more transient than in owner-occupied homes and are less likely to remain in the same home for nine years, and certainly not for 350 days per year over a period of 30 years. Americans, on average, spend approximately 90 percent of their time indoors (United States Environmental Protection Agency, 2014). If this is also true for the residents of the proposed apartment community, they would be outdoors a small percentage of the time and exposed to freeway emissions a corresponding small amount of time. The modeling of carcinogenic risk exposure due to proximity to the I-15 Freeway, therefore, is probably more hypothetical and an overestimate of the actual level of risk exposure.

For carcinogenic exposures, the summation of risk for the maximum exposed residential receptor would be approximately 2.28E-05 (22.8 in one million) for the 30 year and 6.83E-06 (6.83 in one million) for the 9 year exposure scenarios. In comparison to the SCAQMD Significance threshold level of ten (10) in one million, carcinogenic risks would exceed the applicable thresholds for the 30

year exposure scenario only. The HRA assessment conducted for the proposed Project assesses potential risk to the entire Project site. To reduce the exposure levels, mitigation is recommended herein to ensure air filtration systems are provided for each residential apartment unit. With the installation of air filtration systems for each residential unit, the summation of risk for the maximum exposed residential receptor would total 4.56E-06 (4.56 in one million) for the 30 year and 1.37E-06 (1.37 in one million) for the 9 year exposure scenarios. In comparison to the threshold level of ten in one million, carcinogenic risks would not exceed the applicable thresholds for both the 30 and 9 year exposure scenario. Therefore, with the use and proper on-going maintenance of air filtration systems (as would be assured by Mitigation Measures AQ-4 and AQ-5), carcinogenic exposures would be within acceptable limits and impacts would be less than significant.

Non-Carcinogenic Hazards

An evaluation of the potential non-cancer effects of contaminant exposures also was conducted. Under the point estimate approach, adverse health effects are evaluated by comparing the concentration of each compound with the appropriate Reference Exposure Level (REL). Available REL's presented in the Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values were considered in the health risk assessment (see *Technical Appendix A2*).

To quantify non-carcinogenic impacts, the hazard index approach was used. The hazard index assumes that sub-threshold exposures adversely affect a specific organ or organ system (i.e., toxicological endpoint). For each discrete pollutant exposure, target organs presented in regulatory guidance were utilized.

To calculate the hazard index, the pollutant concentration or dose is divided by the appropriate toxicity value. For compounds affecting the same toxicological endpoint, this ratio is summed. Where the total equals or exceeds one (i.e., unity), a health hazard is presumed to exist. To assess acute non-cancer impacts, the maximum pollutant concentration is divided by the REL for the corresponding averaging time (e.g., 1-hour). No exposure adjustments are considered for short duration exposures.

For chronic non-carcinogenic effects, the hazard index identified for each toxicological endpoint totaled less than one for both the 30 year and 9 year exposure scenarios. For acute exposures (i.e., 1 and 8-hour), the hazard indices for the identified averaging times did not exceed unity. Therefore, acute and chronic non-carcinogenic hazards were predicted to be within acceptable limits and are less than significant.

Criteria Pollutant Emissions

The State of California has promulgated strict ambient air quality standards for various pollutants. These standards were established to safeguard the public's health and welfare with specific emphasis on protecting those individuals susceptible to respiratory distress, such as asthmatics, the young, the elderly and those with existing conditions which may be affected by increased pollutant concentrations. However, recent research has shown that unhealthful respiratory responses occur with exposures to pollutants at levels that only marginally exceed clean air standards. The SCAQMD's significance thresholds for operational localized criteria pollutant emissions are

summarized in Table 6-6, *SCAQMD Air Quality Significance Thresholds.* A significant impact would occur if a project caused the exposure of sensitive receptors to localized criteria pollutant emissions in excess of these thresholds.

Table 6-6 SCAQMD Air Quality Significance Thresholds

Pollutant	Averaging Time	Pollutant Concentration
Particulates (PM_{10}) Particulates ($PM_{2.5}$)	24-Hours	2.5 µg/m3 (operation)
Particulates (PM_{10})	Annual	1.0 µg/m3
Carbon Monoxide (CO)	1/8-Hours	SCAQMD is in attainment; impacts are significant if they cause or contribute to an exceedance of the following attainment standards 20 ppm (1-hour) and 9 ppm (8-hour).
Nitrogen Dioxide (NO_2)	1-Hour	SCAQMD is in attainment; impacts are significant if they cause or contribute to an exceedance of the following attainment standard 0.18 ppm.

Abbreviations: parts per million (ppm); micrograms per cubic meter (µg/m3)
Source: Urban Crossroads, 2014b, Table 5-1; SCAQMD Air Quality Significance Thresholds

The analysis contained in *Technical Appendix A2* concludes that residents on-site would be exposed to localized criteria pollutants in excess of SCAQMD's significance thresholds during long-term operation, if the apartments are not equipped with an air filtration system. In the absence of an air filtration system for each apartment unit, the maximum exposed residential receptor on-site would be exposed to localized PM_{10} concentrations of 12.74 µg/m3 (24-hour) and 6.97 µg/m3 (Annual), and $PM_{2.5}$ concentrations of 4.81µg/m3, which are above significance thresholds. Therefore, residents have the potential to be exposed to PM_{10} and $PM_{2.5}$ concentrations. To ensure that Project residents are not exposed to PM_{10} and $PM_{2.5}$ concentrations above threshold levels, air filtration systems and appropriate maintenance of the air filtration systems are required pursuant to Mitigation Measures AQ-4 and AQ-5.

With installation and proper maintenance of an air filtration system, the maximum exposed residential receptor on-site, located adjacent to I-15, would be exposed to localized PM_{10} concentrations of 0.64 µg/m3 (24-hour) and 0.35 µg/m3 (Annual), $PM_{2.5}$ concentrations of 0.24 µg/m3, CO concentrations of 2.69 ppm (1-hour) and 2.09 ppm (8-hour), and NO_2 concentrations of 0.084 ppm (1-hour). All of these localized pollutant concentrations are below the applicable SCAQMD significance threshold. Accordingly, under long-term operating conditions with mitigation, the proposed Project's residents would not be exposed to substantial pollutant concentrations and the impact would be reduced to less than significant.

- **CO Hot Spot Analysis**

A CO "hot spot" would occur if an exceedance of the state one-hour standard of 20 ppm or the eight-hour standard of 9 ppm were to occur. As identified within SCAQMD's 2003 AQMP and the 1992 Federal Attainment Plan for Carbon Monoxide (1992 CO Plan), peak carbon monoxide concentrations in the SCAB were a result of unusual meteorological and topographical conditions and not a result of congestion at a particular intersection.

At Project buildout, the busiest intersections in the Project vicinity would attract approximately 10,363 cumulative vehicle trips per day (i.e., I-15 southbound ramps and Limonite Avenue). In addition, there are no unique topographical or meteorological conditions in the Project vicinity that could contribute to the formation of a CO Hot Spot. Furthermore, the SCAB has been designated as an attainment area for CO since 2007. Therefore, Project-related vehicular emissions would not create a Hot Spot and would not substantially contribute to an existing or projected CO Hot Spot. Impacts would be less than significant and no mitigation is required.

- **Potential Impacts From Future Development on Adjacent Property**

The type of development that may occur on the land zoned for Industrial Park uses immediately to the north cannot be defined at this time, since there is no development proposal under consideration. It would be speculative to assume and evaluate any particular kind of land use that might occur with respect to potential air quality impacts that could affect the Project site. The Project Applicant, who also owns that adjacent I-P zoned property, has indicated it will record covenants on the land title to prohibit future industrial uses on that site. Nevertheless, there is some potential that a future land use might have truck loading docks, outdoor activity areas, etc. or possibly some sort of industrial processing equipment that could generate emissions of air pollutants that could potentially affect future residents within the Project site. Any such future land use would be subject to compliance with the City's Municipal regulations to prohibit generation of hazardous air emissions at adjoining properties, and the development plan would be subject to the City's discretionary approval authority to assure compliance with zoning standards and to examine potential air quality impacts through an assessment of the environmental impacts, pursuant to CEQA. Compliance with the City's existing planning procedures is expected to ensure that some future industrial use, if proposed on the adjacent property, would be designed to prevent significant air pollution impacts to the Project site.

Mitigation

If Project residents were to stay in their apartment units for 9 years, 365 days per year, 24-hours per day, they would be exposed to less-than-significant carcinogenic risk and localized air pollutant concentrations. However, if Project residents were to stay in their apartment units for 30 years, 365 days per year, 24-hours per day (the length of time recommended to be assessed by the U.S Environmental Protection Agency), they would be exposed to significant carcinogenic risk and localized air pollutant concentrations, absent air filtration technology. Therefore, the following mitigation measures shall apply to the proposed Project**.**

> **Mitigation Measure AQ-4:** Prior to every residential building permit final inspection, the City shall verify that an operating air filtration system has been installed in every

apartment. The air filtration system shall have a documented efficiency level equal to or exceeding a Minimum Efficiency Reporting Value (MERV) 16 as defined by the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Standard 52.2. As a condition of occupancy permits, the apartment complex owner/operator/rental management company shall be required to maintain the air filtration systems in good operating condition according to the manufacturer's specifications.

Mitigation Measure AQ-5: The following note shall be specified in each apartment's lease agreement and an operation manual for the air filtration system shall be required in all lease agreements notifying renters of their responsibility to operate the air infiltration system. The Project's rental management company shall enforce the lease agreement.

a. An air filtration system is installed in each apartment unit that achieves a documented efficiency level equal to or exceeding a Minimum Efficiency Reporting Value (MERV) 16 as defined by the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Standard 52.2. Operation of the air filtration system is required to reduce interior air pollutant levels to within South Coast Air Quality Management District standards. It is the responsibility of the apartment occupants to promptly report any and all maintenance issues associated with the air filtration system to the rental management company.

6.3(e) Create objectionable odors affecting a substantial number of people?

Finding: Less-than-Significant Impact

(Sources: Air Quality Impact Analysis, 2014; Project Application Materials)

Proposed construction activities at the Project site could produce odors from equipment exhaust, application of asphalt, and/or the application of architectural coatings. However, any odors emitted during construction would be temporary, short-term, and intermittent in nature, and would cease upon completion of construction activities. Furthermore, standard construction practices would minimize odor emissions and their associated impacts and construction activities would be required to comply with SCAQMD Rule 402, which prohibits the discharge of odorous emissions that would create a public nuisance. Accordingly, the Project is not anticipated to create objectionable odors during construction activities, and short-term impacts would be less than significant.

During long-term operation, the proposed Project would include residential uses, which are not typically associated with objectionable odors. The temporary storage of refuse and the placement of refuse in the apartment community's trash enclosures could be a source of odor; however, Project-generated refuse would be stored in covered containers and removed at regular intervals in compliance with the City's solid waste regulations, thereby precluding any potential impact. In addition, the proposed Project would be required to comply with SCAQMD Rule 402, which prohibits the discharge of odorous emissions that would create a public nuisance. As such, long-term operation of the Project would not create objectionable odors and impacts would be less than significant.

Mitigation:

Although Project-related odor impacts would be less than significant, the following mitigation measure is recommended to ensure compliance with SCAQMD Rule 402.

Mitigation Measure AQ-6: The Project is required to comply with the provisions of South Coast Air Quality Management District Rule 402 "Nuisance." Adherence to Rule 402 reduces the release of odorous emissions into the atmosphere. Prior to grading and building permit issuance, the City shall verify that the following note is included on the grading and building plans. Project contractors shall be required to ensure compliance with the notes and permit periodic inspection of the construction site by City of Jurupa Valley staff or its designee to confirm compliance. The note shall be specified in bid documents issued to prospective construction contractors.

a. There shall be no discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

6.4 BIOLOGICAL RESOURCES

Would the project:	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
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, 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, 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?		✓		

Impact Analysis

6.4(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?

Finding: Less-than-Significant Impact with Mitigation Incorporated

(Sources: Biological Technical Report, 2014; Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), 2003)

Biologist/Regulatory Specialists from Glenn Lukos Associates (GLA) conducted a review of relevant literature, field surveys, and a Geographical Information System (GIS) -based analysis of vegetation communities. The field study focused on a number of primary objectives that would comply with CEQA requirements, including (1) general biological surveys and vegetation mapping; (2) habitat assessments for special-status plant species (including species with applicable Multiple Species Habitat Conservation Plan (MSHCP) survey requirements); (3) habitat assessments for special-status wildlife species (including species with applicable MSHCP survey requirements; (4) focused burrowing owl surveys; (5) assessments for MSHCP riparian/riverine areas and vernal pools; and (6) assessments for areas subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE) jurisdiction pursuant to Section 404 of the Clean Water Act, and California Department of Fish and Wildlife (CDFW) jurisdiction pursuant to Division 2, Chapter 6, Section 1600-1616 of the California Fish and Game Code. GLA conducted general biological surveys and habitat assessments on May 26, 2014 and vegetation mapping on June 25, 2014. In addition, in accordance with the survey guidelines described in the 2006 MSHCP Burrowing Owl Survey Instructions, a focused burrow survey was conducted on June 25, 2014 followed by burrowing owl surveys on June25, July 2, July 15, and July 22, 2014.

The information below is based on the survey results documented in the Biological Technical Reports attached as *Technical Appendix B1 and B2.* Refer to each report for a description of the study methods employed by GLA regarding the general and focused biological resource surveys conducted on the property. Individual plant and wildlife species evaluated in *Technical Appendices B1 and B2* are based on one or more of the following criteria: a) listing through the Federal and/or State Endangered Species Act (ESA); b) occurrence in the California Native Plant Society (CNPS) Rare Plant Inventory (Rank 1A/1B, 2A/2B, 3, or 4); and/or c) occurrence in the California Natural Diversity Database (CNDDB) inventory. Wildlife species were considered "special-status" based on one or more of the following criteria: a) listing through the Federal and/or State ESA; b) designation by the State as a Species of Special Concern (SSC), California Fully Protected (CFP) species, or Watch List species (WL). Vegetation communities and habitats were considered "special-status" base on one or more of the following criteria: Global (G) and/or State (S) ranking of category 3 or less based on CDFW (refer to *Technical Appendix B1* for further explanation of global/state rankings), and riparian habitat.

- **Special-Status Vegetation Types**

The entire Project site and the adjacent vacant 1.5 acre area to the north that would be a receiving site for the Project's exported earth materials are disturbed. The properties are either unvegetated or are dominated by non-native, ruderal species. The CNDDB identifies the following three special-status vegetation communities for the Project area: Southern California Arroyo Chub/Santa Ana Sucker Stream, Southern Cottonwood Willow Riparian Forest, and Southern Sycamore Alder Riparian Woodland. The Project site and parcel to the north do not contain any special-status vegetation types, including those identified by the CNDDB. Therefore, the Project would not impact any vegetation communities, including special-status communities. No impact would occur and no mitigation is required.

- **Special-Status Plants**

Table 4-1 of *Technical Appendices B1 and B2* provides a list of special-status plants evaluated by GLA for the Project site through general biological surveys and habitat assessments. Species were evaluated based on three factors: (1) species identified by the CNDDB and CNPS as occurring (either currently or historically) on or in the vicinity of the Project site; (2) applicable MSHCP survey areas; (3) any other special-status plants that are known to occur within the vicinity of the Project site or for which potentially suitable habitat occurs within the site.

No special-status plants were detected on the Project site or the adjacent off-site soil export area to the north. Due to the lack of suitable habitat and level of disturbance no special-species plants are expected to occur on either property. Accordingly, implementation of the Project would not impact special-status plants. No impact would occur and no mitigation is required.

- **Special-Status Animals**

Table 4-2 of *Technical Appendices B1 and B2* provides a list of special-status animals evaluated by GLA for the Project site through general biological surveys, habitat assessments, and focused surveys. Species were evaluated based on three factors: (1) species identified by the CNDDB as occurring (either currently or historically) on or in the vicinity of the Project site, (2) applicable MSHCP survey areas, and (3) any other special-status animals that are known to occur within the vicinity of the Project site for which potentially suitable habitat occurs.

The Project site and the adjacent off-site soil export area to the north are not located within USFWS designated critical habitat areas and are generally not expected to result in loss of habitat for special-status animals due to a lack of suitable habitat for most species and the level of site disturbance. No special-status animals were detected on either property, although a few species have the potential to occur. Species that have a low probability of occurrence include the California horned lark and San Diego black-tailed jackrabbit; however, impacts to these species would be less than significant due to the low level of sensitivity of these species and the level of site disturbance.

Although no burrowing owls were detected during focused surveys, the Project site and the adjacent off-site soil export area to the north have the potential to support burrowing owls and there is the potential for burrowing owls to occupy these properties prior to commencement of

grading activities. If owls were harmed during construction, it would be a significant impact. To prevent harm to owls during construction, mitigation is required. Implementation of Mitigation Measure BR-1 would ensure that a pre-construction survey for burrowing owl is conducted to determine the presence or absence of burrowing owls prior to Project-related grading activities on the site and in the area of the adjacent off-site soil export area to the north. If present, the mitigation requires avoidance and/or relocation of burrowing owls in conformance with the Western Riverside MSHCP objectives for the species. With implementation of Mitigation Measure BR-1, direct and indirect impacts to burrowing owl would be reduced to below a level of significance.

- **Raptor Use**

The Project site and adjacent parcel to the north provide suitable foraging habitat for a number of raptor species, including special-status raptors.

- **Nesting Birds**

The Project site and adjacent parcel to the north contain shrubs and ground cover that could provide suitable habitat for some species of nesting migratory birds, such as the mourning dove. As such, there is a potential that nesting migratory birds could occupy the Project's disturbance area prior to the commencement of grading activities and be threatened with harm by construction activities. Impacts to nesting birds are prohibited under the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code. Accordingly, the proposed Project has the potential to impact active bird nests if vegetation is removed during the nesting season (February 1 to August 31). As such, there is a potential that the proposed Project could result in direct and/or indirect impacts to nesting migratory birds during construction of the proposed Project. This is a potentially significant impact for which mitigation is required. Implementation of Mitigation Measure BR-2 would ensure that a pre-construction nesting migratory bird survey is conducted to determine the presence or absence of migratory nesting birds prior to Project-related grading activities. If present, the mitigation requires avoidance of migratory bird nests during the breeding season. With implementation of Mitigation Measure BR-2, direct and indirect impacts to nesting birds would be reduced to below a level of significance.

Mitigation

> **Mitigation Measure BR-1:** Within 30 days prior to grading, a qualified biologist shall conduct a survey of the Project's proposed impact footprint (including the off-site stockpile area) and make a determination regarding the presence or absence of the burrowing owl. The determination shall be documented in a report and shall be submitted, reviewed, and accepted by the City of Jurupa Valley Planning Department prior to the issuance of a grading permit and subject to the following provisions:
>
> a. In the event that the pre-construction survey identifies no burrowing owls in the impact area, a grading permit may be issued without restriction.

b. In the event that the pre-construction survey identifies the presence of at least one individual but less than three (3) mating pairs of burrowing owl, then prior to the issuance of a grading permit and prior to the commencement of ground-disturbing activities on the property, the qualified biologist shall passively or actively relocate any burrowing owls. Passive relocation, including the required use of one-way doors to exclude owls from the site and the collapsing of burrows, will occur if the biologist determines that the proximity and availability of alternate habitat is suitable for successful passive relocation. Passive relocation shall follow CDFW relocation protocol and shall only occur between September 15 and February 1. If proximate alternate habitat is not present as determined by the biologist, active relocation shall follow CDFW relocation protocol. The biologist shall confirm in writing that the species has fledged the site or been relocated prior to the issuance of a grading permit.

c. In the event that the pre-construction survey identifies the presence of three (3) or more mating pairs of burrowing owl, the requirements of MSCHP Species-Specific Conservation Objectives 5 for the burrowing owl shall be followed. Objective 5 states that if the site (including adjacent areas) supports three (3) or more pairs of burrowing owls and supports greater than 35 acres of suitable Habitat, at least 90 percent of the area with long-term conservation value and burrowing owl pairs will be conserved onsite until it is demonstrated that MSHCP Species-Specific Conservation Objectives 1-4 have been met. Objectives 1-4 are listed in the MSHCP, Volume I, Appendix E. A grading permit shall only be issued, either:

   i. upon approval and implementation of a property-specific Determination of Biologically Superior Preservation (DBESP) report for the western burrowing owl by the CDFW; or

   ii. a determination by the biologist that the site is part of an area supporting less than 35 acres of suitable habitat, and upon passive or active relocation of the species following accepted CDFW protocols.

Mitigation Measure BR-2: As a condition of approval for all grading permits, vegetation clearing and ground disturbance shall be prohibited during the migratory bird nesting season (February 1 through September 15), unless a migratory bird nesting survey is completed in accordance with the following requirements:

a. A migratory nesting bird survey of the Project's impact footprint shall be conducted by a qualified biologist within three (3) days prior to initiating vegetation clearing or ground disturbance.

b. A copy of the migratory nesting bird survey results report shall be provided to the City of Jurupa Planning Department. If the survey identifies the presence of active nests, then the qualified biologist shall provide the Planning Department with a copy of maps showing the location of all nests and an appropriate buffer zone around each nest sufficient to protect the nest from direct and indirect impact. The size and location of all

buffer zones, if required, shall be subject to review and approval by the Planning Department and shall be no less than a 200-foot radius around the nest for non-raptors and a 500-foot radius around the nest for raptors. The nests and buffer zones shall be field checked weekly by a qualified biological monitor. The approved buffer zone shall be marked in the field with construction fencing, within which no vegetation clearing or ground disturbance shall commence until the qualified biologist and Planning Department verify that the nests are no longer occupied and the juvenile birds can survive independently from the nests.

6.4(b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Finding: No Impact

(Sources: Biological Technical Report, 2014; Western Riverside County MSHCP, 2003)

GLA conducted an assessment for MSHCP riparian/riverine areas and vernal pools, and a jurisdictional delineation for Waters of the United States (including wetlands subject to the jurisdiction of the USACE and Regional Water Quality Control Board (RWQCB), and streams (including riparian vegetation) and lakes subject to the jurisdiction of the CDFW.

As discussed above in Item 6.4(b), the entire Project site and the adjacent off-site soil export area to the north are disturbed, and are either unvegetated or are dominated by non-native, ruderal species. Accordingly, the Project's physical disturbance area does not contain any special-status vegetation types including those identified by the CNDDB. In addition, the Project site and adjacent parcel to the north do not contain any jurisdictional water or any riparian/riverine areas or vernal pools. Thus, no impact would occur and no mitigation is required.

6.4(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, etc.) through direct removal, filling, hydrological interruption, or other means?

Finding: No Impact

(Sources: Biological Technical Report, 2014; Western Riverside County MSHCP, 2003)

GLA conducted an assessment for MSHCP riparian/riverine areas and vernal pools, and a jurisdictional delineation for Waters of the United States (including wetlands subject to the jurisdiction of the USACE and RWQCB, and streams (including riparian vegetation) and lakes subject to the jurisdiction of the CDFW**.**

The Project site and the adjacent off-site soil export area to the north do not contain any jurisdictional water or any riparian/riverine areas or vernal pools. Thus, no impact would occur and no mitigation is required.

6.4(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?

Finding: No Impact

(Sources: Biological Technical Report, 2014; Western Riverside County MSHCP, 2003)

Volume I, Section 6.1.4 of the MSHCP (Urban/Wildland Interface Guidelines) identifies guidelines that are intended to address indirect effects associated with locating projects (particularly development) in proximity to the MSHCP Conservation Area. To minimize edge effects, the guidelines are to be implemented in conjunction with review of individual public and private development projects in proximity to the MSHCP Conservation Area.

The proposed Project is not located in proximity to the MSHCP Conservation area or other native habitats. As such, implementation of the proposed Project would not interfere substantially with the movement of any wildlife species. In addition, there are no native wildlife nursery sites in close proximity to the Project site. Thus, no impacts would occur and no mitigation is required.

6.4(e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Finding: No Impact

(Sources: Biological Technical Report, 2014; Western Riverside County MSHCP, 2003)

The City has adopted all County of Riverside ordinances and resolutions in effect as of July 1, 2011, to remain in full force and effect as City regulations. As such, the Project would be required to comply with the Riverside County Oak Tree Management Guidelines, which were adopted for the purpose of reducing impacts to oak woodland within the County. However, the Project site and the adjacent receiving site for earth materials do not contain oak woodland or oak trees, so these Guidelines would not be applicable to the Project. There are no other ordinances in place protecting biological resources that are applicable to the Project or Project site. Therefore, no impact would occur and no mitigation is required.

6.4(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?

Finding: Less-than-Significant Impact with Mitigation Incorporated

The analysis below evaluates the proposed Project with respect to the Project's consistency with Western Riverside County MSHCP Reserve assembly requirements, Section 6.1.2 (Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools), Section 6.1.3 (Protection of Narrow Endemic Plant Species), Section 6.1.4 (Guidelines Pertaining to the Urban/Wildlands Interface), and Section 6.3.2 (Additional Survey Needs and Procedures).

- **Project Relation to Reserve Assembly**

The Project site and the adjacent off-site soil export area to the north that would serve as a receiving site for the Project's exported earth materials are not located within the MSHCP Criteria Area. As such, the Project site and adjacent parcel to the north are not targeted for conservation by the MSHCP to meet Reserve Assembly goals. No impact would occur and no mitigation is required.

- **Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools**

The Project site and adjacent land to the north do not contain any riparian/riverine or vernal pools. Therefore, the Project would not impact any riparian/riverine areas or vernal pools, or any species associated with such features. As such, the Project would be consistent with Volume I, Section 6.1.2 of the MSHCP. No impact would occur and no mitigation is required.

- **Protection of Narrow Endemic Plants**

Volume I, Section 6.1.3 of the MSHCP requires that within identified Narrow Endemic Plant Species Survey Areas (NEPSSA), site-specific focused surveys for Narrow Endemic Plants Species will be required for all public and private projects where appropriate soils and habitat are present.

The Project site and adjacent parcel to the north are located in NEPSSA 7, which identifies the following target species: San Miguel savory, San Diego ambrosia, and Brand's phacelia. There is no potential for suitable habitat for these species to be located in the Project's physical disturbance area and therefore the Project would not impact any Narrow Endemic Plants. As such, the Project would be consistent with Volume I, Section 6.13 of the MSHCP. No impact would occur and no mitigation is required.

- **Guidelines Pertaining to the Urban/Wildland Interface**

The *MSHCP Urban/Wildland Interface Guidelines* are intended to address indirect effects ("edge effects") associated with locating development in proximity to the MSHCP Conservation Area. Edge effects are identified in the MSCHP as: Drainage; Toxics; Lighting; Noise; Invasive Species; Barriers; and Grading/Land Development.

The Project site and adjacent parcel to the north are not located in proximity to the MSHCP Conservation Area. Therefore, the Urban/Wildland Guidelines do not apply to the Project. The Project would be consistent with Volume I, Section 6.1.4 of the MSHCP. No impact would occur and no mitigation is required.

Additional Survey Needs and Procedures

Volume I, Section 6.3.2 of the MSHCP requires habitat assessments and focused surveys for projects located within the CAPSSA, burrowing owl, mammal, and amphibian survey areas. The Project site and adjacent parcel to the north are located within the burrowing owl survey area, but not the CAPPSA, mammal, or amphibian survey areas. Focused burrowing owl surveys were conducted for the Project site and adjacent parcel to the north and burrowing owls were not detected on either property. As discussed in the analysis under Issue 6.4(a) the Project would conduct pre-

construction burrowing owl surveys in compliance with MSHCP Objective 6 for burrowing owls. Therefore, with compliance with Mitigation Measure BR-1, the Project would be consistent with Volume I, Section 6.3.2 of the MSHCP and impacts would be reduced to less than significant.

Mitigation

Mitigation BR-1 shall apply.

In summary, the proposed Project would be consistent with the biological requirements of the MSHCP, specifically pertaining to reserve assembly, Section 6.1.2 (Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools), Section 6.1.3 (Protection of Narrow Endemic Plant Species), Section 6.1.4 (Guidelines Pertaining to the Urban/Wildlands Interface), and Section 6.3.2 (Additional Survey Needs and Procedures.)

6.5 CULTURAL RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines §15064.5?				✓
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines §15064.5?		✓		
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		✓		
d. Disturb any human remains, including those interred outside of formal cemeteries?			✓	

Impact Analysis

6.5(a) Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines §15064.5?

Finding: No Impact

(Sources: Cultural Resources Assessment, 2014)

The Project site and the adjacent property which would receive the exported earth material is not known to have a unique historical significance to the region. Historic maps and aerial photographs reviewed by LSA Associates, Inc. (LSA) show that the Project area was partly disked or plowed in 1938 but on the 1948 photograph the Project area was not disked or plowed. Aerial photographs from 1959, 1967, and 1979 show the entire Project area as plowed. A 2005 aerial photograph shows the western portion of the Project area was disked and plowed and I-15 was located to the south of the Project site. Historic maps from 1947 to 1982 depict a power line running north-south through the Project area and along the southern edge of the Project area. Under existing conditions, LSA observed a dirt road in the area where the power line was shown on the 1947 and 1948 historic photographs. The only two power poles that currently exist in the Project area are a tubular steel pole along the north side of 68th Street and a wooden pole east of the tubular steel pole and west of Pats Ranch Road.

For more information on the area's history and historical context, refer to the Cultural Resources Assessments contained as *Technical Appendices C1 and C3*.

CEQA Guidelines §15064.5(a) clarifies that historical resources include the following:

1. A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources.
2. A resource included in a local register of historical resources, as defined in section 5020.1(k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements [of] section 5024.1(g) of the Public Resources Code.
3. Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.

A cultural resources field survey of the proposed Project site and the adjacent soil export site was conducted by LSA Associates, Inc. (LSA) on May 30, 2014; the results of which are provided in *Technical Appendices C1 and C3*. LSA observed extensive mechanized ground disturbance along the west side of the Project site due to construction of an elevated dirt road, in the southeastern portion of the Project site from bulldozing and dumping, and throughout the remainder of the Project site due to historical agricultural use of the land, as well as from recent disking. No structures or other improvements were observed on the Project site or the adjacent soil export site. LSA did not identify any cultural resources during the survey. Accordingly, the Project disturbance area contains no known historic resources. No impact would occur.

6.5(b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines §15064.5?

Finding: Less-than-Significant Impact with Mitigation Incorporated

(Sources: Cultural Resources Assessment, 2014)

In addition to a field survey of the Project site LSA also conducted a records search at the Eastern Information Center (EIC). The records search indicated that the Project site had been previously surveyed and no cultural resources were documented as a result of that records search.

According to the LSA Cultural Resources Assessment, the Project site is located on the boundary of the traditional cultural territories of the Cahuilla and the Gabrielino; these territorial boundaries were somewhat fluid and changed through time. The City is conducting consultation with local Native American tribes regarding the proposed Project pursuant to the requirements of California Government Code Section 65352.3 (Senate Bill 18). The consultation process is still underway. Refer to *Technical Appendices C1 and C3* for more information about the cultural setting of the Project site and the adjacent soil export site.

Based on the results of the field survey and records search conducted by LSA, the Project site contains no known cultural resources. Furthermore, due to the past agricultural operations that have occurred on the Project site for over 80 years, the potential for subsurface archeological deposits to be present on the Project site is considered to be low. Regardless, there is a remote potential to uncover archaeological resources during excavation and/or grading activities on the Project site. If significant resources as defined in California Code of Regulations, Section 15064.5 are unearthed, they could be significantly impacted if not appropriately treated. Although the

Project site does not contain any recorded or known archaeological resources and the likelihood of uncovering previously unknown resources during construction is considered low, Mitigation Measures CR-1 through CR-3 are proposed to mitigate potential impacts to archaeological resources to the maximum extent feasible. Implementation of these measures would ensure that an archaeological monitoring program is implemented during ground disturbing activities, and would ensure that any archaeological resources that may be uncovered are appropriately treated as recommended by a qualified archaeologist. With implementation of the required mitigation, the Project's potential impact to archaeological resources would be reduced to the maximum extent feasible and would be less than significant.

Mitigation

Mitigation Measure CR-1: Prior to the issuance of a grading permit, the Project Proponent shall provide evidence to the City that a qualified professional archaeological monitor has been retained by the Project Applicant to conduct monitoring of all mass grading and trenching activities involving excavation in previously undisturbed soils and has the authority to halt and redirect earthmoving activities in the event that suspected archaeological resources are unearthed during Project construction.

Mitigation Measure CR-2: Prior to the issuance of a grading permit, the Project Proponent shall provide evidence to the City that appropriate Native American representative(s) shall be allowed to monitor and have received or will receive a minimum of 15 days advance notice of mass grading activities involving excavation in previously undisturbed soils. During grading operations in previously undisturbed soils, a professional archaeological monitor shall observe the grading operation until such time as the monitor determines that there is no longer any potential to uncover buried cultural deposits. If the monitor suspects that an archaeological resource may have been unearthed, the monitor shall immediately halt and redirect grading operations in a 100-foot radius around the find to allow identification and evaluation of the suspected resource. If the monitor determines that the suspected resource is potentially significant, the archaeologist shall notify the appropriate Native American Tribe(s) and invite a tribal representative to consult on the resource evaluation. In consultation with the appropriate Native American Tribe(s), if such Tribe(s) choose to participate, the archaeological monitor shall evaluate the suspected resource and make a determination of significance pursuant to California Public Resources Code Section 21083.2. If the resource is significant, Mitigation Measure CR-3 shall apply.

Mitigation Measure CR-3: If a significant archaeological resource(s) is discovered on the property, ground disturbing activities shall be suspended 100 feet around the resource(s). The archaeological monitor and a representative of the appropriate Native American Tribe(s), if such Tribal representative (s) choose to participate, the Project Proponent, and the City Planning Department shall confer regarding mitigation of the discovered resource(s). A treatment plan shall be prepared and implemented by the archaeologist to protect the identified archaeological resource(s) from damage and destruction. The treatment plan shall contain a research design and data recovery program necessary document the size and content of the discovery such that the resource(s) can be evaluated

for significance under CEQA criteria. The research design shall list the sampling procedures appropriate to exhaust the research potential of the archaeological resource(s) in accordance with current professional archaeology standards (typically this sampling level is two (2) to five (5) percent of the volume of the cultural deposit). The treatment plan shall require monitoring by the appropriate Native American Tribe(s), if such Tribe(s) choose to monitor, during data recovery excavations of archaeological resource(s) of prehistoric origin, and shall require that all recovered artifacts undergo laboratory analysis. At the completion of the laboratory analysis, any recovered archaeological resources shall be processed and curated according to current professional repository standards. The collections and associated records shall be donated to an appropriate curation facility, or, the artifacts may be delivered to the appropriate Native American Tribe(s) if that is recommended by the City of Jurupa Valley and if an appropriate Tribe or Tribes desire to accept such collections and records. A final report containing the significance and treatment findings shall be prepared by the archaeologist and submitted to the City of Jurupa Valley Planning Department and the Eastern Information Center.

6.5(c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Finding: Less-than-Significant Impact with Mitigation Incorporated

(Sources: Paleontological Resources Assessment, 2014; Riverside County Land Information System Paleontological Sensitivity Map, accessed January 5, 2015)

The Project site and the adjacent soil export site do not contain any unique geologic features. Thus, the Project has no potential to impact a unique geologic feature.

The results of the locality search and the field survey conducted by LSA indicate that there are no known paleontological resources within the Project site or within a 1.0 mile radius of the Project site. However, scientifically significant paleontological resources have been recovered elsewhere in the Inland Empire and Southern California from Early to Late Pleistocene deposits similar to those at the surface and in the subsurface of the Project site. The Holocene to Late Pleistocene Young Alluvial Channel Deposits in the central portion of the Project site have high paleontological sensitivity below depths of five feet or more. The Late to Middle Pleistocene Old Alluvial Channel Deposits in the southeastern portion of the Project site and the Very Old Alluvial Channel Deposits in the northwestern portion of the Project site and beneath the adjacent soil export site have high paleontological sensitivity. A Paleontological Sensitivity Map that identifies these areas is contained in *Technical Appendices C2 and C4*. The Paleontological Sensitivity Map in the Paleontological Assessment for the proposed Project identifies the center of the Project site as having Low Sensitivity surface to 5 feet deep, with High Sensitivity below 5 feet. The remainder of the Project Site is identified as having a High Sensitivity. The Riverside County Land Information System identifies the Project site as "High A" for paleontological sensitivity. This classification applies to lands where geologic formations or mappable rock that have yielded fossilized body elements and trace fossils such as tracks, nests and eggs.

Given the occurrence of paleontologically sensitive deposits within the proposed grading footprint, there is a potential to encounter scientifically significant, nonrenewable paleontological resources during ground disturbing activities at the surface in the southeastern and northwestern portions of the Project site, as well as in the central portion if excavation extends below this 5 foot depth. The Project's potential to adversely impact a unique paleontological resource or site as is a potentially significant impact prior to implementation of mitigation measures.

Implementation of Mitigation Measures CR-4 through CR-7 would ensure that a Paleontological Resources Impact Mitigation Plan (PRIMP) is implemented during ground disturbing activities, and would ensure that any scientifically significant, nonrenewable paleontological resources that may be encountered are appropriately treated as recommended by a qualified paleontologist. With implementation of the required Mitigation Measures CR4 through CR-7, the Project's potential impact to paleontological resources would be reduced to less than significant.

Mitigation

Mitigation Measure CR-4: Prior to the issuance of grading permits, the Project Proponent shall provide a letter of verification to the City of Jurupa Valley stating that a qualified paleontologist has been retained to develop a Paleontological Resources Impact Mitigation Plan (PRIMP). The PRIMP shall include the methods that will be used to protect paleontological resources that may exist within the Project site, as well as procedures for monitoring, fossil preparation and identification, curation of specimens into an accredited repository, and preparation of a report at the conclusion of the monitoring program to be submitted to the City of Jurupa Valley.

Mitigation Measure CR-5: During excavation and grading activities in deposits with a high paleontological sensitivity rating (identified on Figure 3, Paleontological Sensitivity Map, of the Project's Paleontological Resources Assessment, as Young Alluvial Channel Deposits below a depth of 5 feet from the surface, Old Alluvial Channel Deposits, and Very Old Alluvial Channel Deposits) shall be monitored on a full-time basis by a qualified paleontological monitor following the Paleontological Resources Impact Mitigation Plan (PRIMP).

Mitigation Measure CR-6: Excavation and grading activities in deposits with low paleontological sensitivity (identified on Figure 3, Paleontological Sensitivity Map, of the Project's Paleontological Resources Assessment, as Young Alluvial Channel Deposits from the surface to a depth of 5 feet) shall be monitored by a qualified paleontological monitor on a spot-check basis.

Mitigation Measure CR-7: If paleontological resources are encountered during the course of ground disturbance activities, the paleontological monitor shall have the authority to temporarily redirect construction away from the area of the find in order to assess its scientific significance. Collected resources shall be prepared to the point of identification, identified to the lowest taxonomic level possible, catalogued, and curated into the permanent collections of an accredited scientific institution. At the conclusion of the

monitoring program, a report of findings shall be prepared to document the results of the monitoring program.

Mitigation Measure CR-8: In the event that paleontological resources are encountered when a paleontological monitor is not present, work in the immediate area of the find shall be redirected and a paleontologist shall be contacted to assess the find for scientific significance. In addition, if the find is located in sediments with a low paleontological sensitivity rating (Young Alluvial Channel Deposits from the surface to a depth of 5 feet), the paleontologist shall make recommendations as to whether monitoring shall be required in these sediments on a full-time basis.

6.5(d) Disturb any human remains, including those interred outside of formal cemeteries?

Finding: Less-than-Significant Impact

(Sources: Cultural Resources Assessment, 2014)

The Project site does not contain a cemetery and no known formal cemeteries are located within the immediate site vicinity. Field surveys conducted on the Project site did not identify the presence of any human remains and no human remains are known to exist beneath the surface of the site. Nevertheless, the remote potential exists that human remains may be unearthed during grading and excavation activities associated with Project construction. In the event that human remains are discovered during Project grading or other ground disturbing activities, the Project would be required to comply with the applicable provisions of California Health and Safety Code §7050.5 as well as Public Resources Code §5097 et. seq. California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made the necessary findings as to origin. Pursuant to California Public Resources Code Section 5097.98(b), remains shall be left in place and free from disturbance until a final decision as to the treatment and disposition has been made by the Coroner. If the Coroner determines the remains to be Native American, the California Native American Heritage Commission (NAHC) must be contacted and the NAHC must then immediately notify the "most likely descendant(s)" of receiving notification of the discovery. The most likely descendant(s) shall then make recommendations within 48 hours, and engage in consultations concerning the treatment of the remains as provided in Public Resources Code Section 5097.98. Mandatory compliance with these requirements would ensure that potential impacts associated with the discovery of human remains would be less than significant and mitigation is not required.

Mitigation

Although impacts to human remains are not anticipated, the following mitigation measure is recommended to ensure compliance with California Health and Safety Code Section 7050.5 and California Public Resources Code Section 5097.98.

Mitigation Measure CR-9: Prior to grading permit issuance, the City shall verify that the following note is included on the grading plan. Project contractors shall be required to

ensure compliance with the note. This note also shall be specified in bid documents issued to prospective construction contractors.

a. If human remains are encountered, California Health and Safety Code Section 7050.5 requires that no further disturbance occur until the Riverside County Coroner has made the necessary findings as to origin. Further, pursuant to California Public Resources Code Section 5097.98(b), remains shall be left in place and free from disturbance until a final decision as to the treatment and disposition has been made by the Coroner. If the Riverside County Coroner determines the remains to be Native American, the California Native American Heritage Commission must be contacted within 24 hours. The Native American Heritage Commission must then immediately notify the "most likely descendant(s)" of receiving notification of the discovery. The most likely descendant(s) shall then make recommendations within 48 hours, and engage in consultations concerning the treatment of the remains as provided in Public Resources Code Section 5097.98.

6.6 GEOLOGY AND SOILS

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
1) 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.				✓
2) Strong seismic ground shaking?			✓	
3) Seismic-related ground failure, including liquefaction?		✓		
4) 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-site or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?		✓		
d. Be located on expansive soil, as defined in the Uniform Building Code, creating substantial risks to life or property?			✓	
e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				✓

Impact Analysis

6.6(a)(1) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: 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.

Finding: No Impact

(Sources: Geotechnical Engineering Investigation, 2014)

The Project site is not located within any Alquist-Priolo Earthquake Fault Zones, no known faults underlie the site, and no active or potentially active faults are trending towards or through the site. The nearest mapped fault is the Chino-Central Avenue Fault Zone, which is located approximately 6.2 miles from the Project site. Because there are no known faults located on the Project site, there is no potential for the Project site to rupture during a seismic event. Thus, the proposed Project would not expose people or structures to adverse effects related to rupture of a known earthquake fault.

6.6(a)(2) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: Strong seismic ground shaking?

Finding: Less-than-Significant Impact

(Sources: Geotechnical Engineering Investigation, 2014; RCLIS)

The Project site is located in a seismically active area of southern California and is expected to experience moderate to severe seismic-induced ground shaking during the lifetime of the Project. This risk is not considered substantially different than that of other similar properties in the southern California area. As a mandatory condition of Project approval, the Project would be required to construct proposed structures in accordance with the California Building Standards Code (CBSC), also known as California Code of Regulations (CCR), Title 24 and the City Building Code. The CBSC and the City Building Code are designed to preclude significant adverse effects associated with strong seismic-ground shaking. In addition, the Project would be conditioned to comply with the site-specific ground preparation and construction recommendations contained in the Project's Geotechnical Engineering Investigation prepared for the Project (refer to *Technical Appendix D*). With mandatory compliance with these standard and site-specific design and construction measures, potential adverse impacts associated with seismically induced ground shaking would be reduced to less than significant. As such, the Project would not expose people or structures to substantial adverse effects, including loss, injury, or death involving seismic ground shaking and additional mitigation is not required.

Mitigation

The following mitigation measure is recommended to ensure compliance with the California Code of Regulations, Title 24.

> **Mitigation Measure GE-1:** Prior to grading and building permit issuance, the City shall verify that the following note is included on grading and building plans. Project contractors shall be required to ensure compliance with the note. This note also shall be specified in bid documents issued to prospective construction contractors.
>
> a. Construction activities shall occur in accordance with all applicable requirements of the California Code of Regulations (CCR), Title 24 (also known as the California Building Code Standards Code (CBSC) in effect at the time of construction.

6.6(a)(3) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: Seismic-related ground failure, including liquefaction?

Finding: Less-than-Significant Impact with Mitigation Incorporated

(Sources: Geotechnical Engineering Investigation, 2014; RCLIS)

Liquefaction and seismically induced settlement typically occur in loose granular and low-plastic silt and clay soils with groundwater near the ground surface. During an earthquake, ground shaking causes the soil to consolidate and increases the pore pressures in saturated soils. It is during severe ground shaking that loose, granular soils below the groundwater table can liquefy. The Project site contains soils that may be subject to liquefaction during seismic ground shaking. According to Riverside County Land Information System (RCLIS) mapping, the Project site is mapped with moderate to high liquefaction potential. Liquefaction can manifest in several ways, including the loss of bearing, lateral spread, dynamic settlement, and flow failure. NorCal Engineering conducted an analysis of the Project site, including the drilling of exploratory borings and trenches into the Project site's soils. Detailed results are included in *Technical Appendix D*. In summary, the potential for liquefaction is considered to be low due to the density of the subsurface soils and depth of historic groundwater below 50 feet. Seismic-induced settlements could be on the order of less than one inch and should occur rather uniformly across the site. Differential settlements would be less than one inch over a 100 feet distance in the building area.

As noted above under the response to Issue 6.6(a)(2), the Project would be designed and constructed in accordance with the latest applicable seismic safety guidelines, including the standard requirements of the CBSC and City Building Code. The Project would be required to comply with the site-specific grading and construction recommendations contained within the Project's Geotechnical Engineering Investigation (*Technical Appendix D*), which the City would make conditions of Project approval to reduce the risk of seismic-related ground failure due to liquefaction. Although compliance with the Project's geotechnical engineering recommendations would be made conditions of Project approval, Mitigation Measure GE-2 is provided below to further ensure compliance. As such, implementation of the Project would result in less than significant impacts associated with seismic-related ground failure and/or liquefaction hazards.

Mitigation

> **Mitigation Measure GE-2:** Prior to the issuance of grading and building permits, a licensed geotechnical engineer contracted to the City or the Project Proponent shall review the detailed construction plans and make a written determination of concurrence with the recommendations specified in the Project's Geotechnical Investigation on file with the City associated with Master Case 1485. The written determination shall be filed with the City of Jurupa Valley. The City shall verify that all of the recommendations given in the Project's Geotechnical Engineering Investigation and written determination are incorporated into the grading and building specifications, including but not limited to all disturbed top soils and surficial and stockpiled fill (about 1 to 18 feet below existing ground surface) shall be removed to competent native material, the exposed surface scarified to a depth of 12 inches, brought to within 2 percent of optimum moisture content and compacted to a minimum of

90% of the laboratory standard (ASTM: D-1557) prior to placement of any additional compacted fill soils, foundations, slabs-on-grade and pavement. In areas of transition between the underlying native material and engineered fill, additional overexcavation of the native material consisting of a depth of two (2) feet below proposed foundations is required to mitigate for differential settlement. This fill shall extend a minimum of five (5) horizontal feet or to a depth of vertical excavation, whichever is greater, beyond the outside edge of the perimeter foundation.

6.6(a)(4) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: Landslides?

Finding: No Impact

(Sources: Geotechnical Engineering Investigation, 2014; City of Jurupa Valley General Plan, Figure S-4, Earthquake Induced Slope Instability Map)

The Project site is generally flat and gently slopes north to south at elevations ranging from 624 feet to 644 feet above mean sea level. The Project site is not mapped in an area considered susceptible to seismically induced landslides or rockfalls as shown on City of Jurupa Valley General Plan Figure S-4, Earthquake Induced Slope Instability Plan. Landslide impacts would not occur and no mitigation is required.

6.6(b) Result in substantial soil erosion or the loss of topsoil?

Finding: Less-than-Significant Impact

(Sources: Geotechnical Engineering Investigation, 2014)

❑ **Impact Analysis for Temporary Construction-Related Activities**

Under existing conditions, the Project site is vacant undeveloped land that has been disked and has been subjected to dumping and bulldozing. Proposed grading activities would loosen and expose soils at the Project site, which would increase erosion susceptibility during windy conditions and rainstorms. In addition, exported soil is proposed to be placed on the parcel to the immediate north and such soils would be subject to erosion until a soil binder or hydroseed mix is applied. Exposed soils, along with any fill materials being stockpiled on the site for use in the grading operation, would be subject to erosion during rainfall events or high winds due to the removal of the low growth vegetation cover consisting of natural grasses and weeds, and exposure of these erodible materials to wind and water.

Pursuant to the requirements of the State Water Resources Control Board, the Project Applicant is required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for construction activities, including proposed grading and soil stockpiling. The NPDES permit is required for all projects that include construction activities, such as clearing, stockpiling of soil, grading, and/or excavation that disturb at least one acre of total land area. The City's MS4 NPDES Permit requires the Project Proponent to prepare and submit to the City for approval a Project-specific Storm Water Pollution Prevention Plan (SWPPP). The SWPPP would identify a combination

of erosion control and sediment control measures (i.e., Best Management Practices) to reduce or eliminate sediment discharge to surface water from storm water and non-storm water discharges during construction. In addition, as described above under the evaluation of 6.3, Air Quality, the Project would be required to comply with SCAQMD Rule 403, which would reduce the amount of particulate matter in the air and minimize the potential for wind erosion. With mandatory compliance to the requirements noted in the Project's SWPPP, as well as applicable regulatory requirements, the potential for water and/or wind erosion impacts during Project construction would be less than significant and mitigation is not required.

Impact Analysis for Long-Term Operational Activities

Following construction, potential wind and water erosion on the Project site would be minimal, as the areas disturbed during construction would be landscaped or covered with impervious surfaces and drainage would be controlled through a storm drain system. Implementation of the Project would essentially eliminate the existing conditions on the Project site that could lead to soil erosion. Topsoils would be excavated and may be reused throughout the site, as deemed suitable by the project's geotechnical engineer. Any loss of topsoil that cannot be reused would be considered a less than significant impact because the topsoil is not associated with any agriculture or farming activities. Additionally, the soil is not classified as Prime Farmland due to its physical and chemical properties. The exported soil that is proposed to be placed on the land to the north would be stabilized with either a soil binder or a hydroseed mix.

As described above, the City's MS4 NPDES Permit requires the Project Proponent to prepare and submit to the City for approval a Project-specific SWPPP and Water Quality Management Plan (WQMP), to address the developed site condition. The WQMP (refer to *Technical Appendix G2*) identifies an effective combination of erosion control and sediment control measures (i.e., Best Management Practices) to reduce or eliminate discharge to surface water from storm water and non-storm water discharges. The WQMP for the Project requires post-construction measures to ensure on-going erosion protection. Compliance with the WQMP would be required as a condition of Project approval and long-term maintenance of on-site water quality features is required. Therefore, implementation of the proposed Project would not significantly increase the risk of erosion on- or off-site in the long term. Impacts would be less than significant and mitigation is not required.

Mitigation

Although impacts associated with soil erosion would be less than significant, the following mitigation measures are recommended to ensure compliance with regulatory permitting requirements.

> **Mitigation Measure GE-3:** Prior to grading permit issuance, the Project Proponent shall obtain a National Pollutant Discharge Elimination System (NPDES) permit from the State Water Resources Control Board. Evidence that an NPDES permit has been issued shall be provided to the City of Jurupa Valley prior to issuance of the first grading permit.
>
> **Mitigation Measure GE-4:** Prior to grading permit issuance, the Project Proponent shall prepare a Stormwater Pollution Prevention Plan (SWPPP). Project contractors shall be

required to ensure compliance with the SWPPP and permit periodic inspection of the construction site by City of Jurupa Valley staff or its designee to confirm compliance.

Mitigation Measure GE-5: Project contractors shall be required to ensure compliance with the Project's Water Quality Management Plan (WQMP) associated with Master Case 1485 and permit periodic inspection of the construction site by City of Jurupa Valley staff or its designee to confirm compliance.

6.6(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-site or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Finding: Less-than-Significant Impact with Mitigation Incorporated

(Sources: Geotechnical Engineering Investigation, 2014; City of Jurupa Valley General Plan, Figure S-4, Earthquake Induced Slope Instability Map; RCLIS)

The Project site is relatively flat, descending gradually approximately 10 to 15 feet from north to south. The Project site is not mapped in an area considered susceptible to seismically induced landslides or rockfalls as shown on City of Jurupa Valley General Plan Figure S-4, Earthquake Induced Slope Instability Plan. Accordingly, no impacts associated with landslides would occur.

The Project site is located in an area designated on the Riverside County Land Information System (RCLIS) as susceptible to subsidence. However, based on laboratory testing of subsurface soils from the Project site and because the property is not situated at or near a valley margin or along an active fault, NorCal Engineering determined that the potential for land subsidence and ground fissures is considered low (refer to *Technical Appendix D*). Although compliance with the Project's geotechnical engineering recommendations would be made conditions of Project approval, Mitigation Measure GE-6 is provided below to ensure compliance. Accordingly, impacts associated with subsidence and collapse would be less than significant.

Lateral spreading is primarily associated with liquefaction hazards. As noted above under Issue 6.6(a)(3), potential for liquefaction is considered to be low due to the density of the subsurface soils and depth of historic groundwater below 50 feet. Seismic-induced settlements could be on the order of less than one inch and should occur rather uniformly across the site. Differential settlements would be less than on inch over a 100 feet distance in the building area. Accordingly, impacts associated with liquefaction and lateral spreading would be less than significant.

Mitigation

Mitigation Measure GE-6: Prior to the issuance of grading and building permits, a licensed geotechnical engineer retained to the City or the Project Proponent shall review the detailed construction plans and sections and make a written determination of concurrence with the recommendations specified in the Project's Geotechnical Reports associated with Master Case 1485. The written determination shall be filed with the City of Jurupa Valley. The City shall verify that all of the recommendations given in the Project's Geotechnical Reports and written determination are incorporated into the grading and building specifications,

including but not limited to the recommendation to remove near surface soils down to competent materials and replace those soils with properly compacted fill to limit the potential for soil subsidence, collapse, and expansion.

Mitigation Measure GE-1 shall also apply.

6.6(d) Be located on expansive soil, as defined in the Uniform Building Code creating substantial risks to life or property?

Finding: Less than Significant Impact

(Sources: Geotechnical Engineering Investigation, 2014)

Expansive soils are fine-grained silts and clays which are subject to swelling and contracting. The amount of this swelling and contracting is subject to the amount of fine-grained clay materials in the soils and the amount of moisture either introduced or extracted from the soils. As documented in *Technical Appendix D,* the Project site contains expansive soils. With mandatory implementation of standard building requirements, including the requirements of the CBC and City Building Code, and the site-specific grading and construction recommendations contained within the Project's Geotechnical Engineering Investigation, including but not limited to the Expansive Soil Guidelines, existing expansive soils would be removed and replaced with competent materials; thus, the site would be adequately stabilized to accommodate proposed development. Mitigation Measure GE-6 is nonetheless recommended to ensure compliance with the recommendations given in the Project's Geotechnical Engineering Investigation report.

Mitigation

Mitigation Measure GE-6 shall apply.

6.6(e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

Finding: No Impact

(Sources: Project Application Materials)

The Project proponent does not propose the use of septic tanks or alternative waste water disposal systems. The Project would install domestic sewer infrastructure and connect to the Jurupa Community Service District's (JCSD's) existing sewer conveyance and treatment system. Accordingly, no impact associated with septic tanks or alternative waste water systems would occur and mitigation is not required.

6.7 GREENHOUSE GAS EMISSIONS

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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?			✓	

Impact Analysis

An individual project cannot generate enough GHG emissions to influence global climate change. The Project participates in this potential impact by its incremental contribution combined with the cumulative increase of all other sources of GHGs, which when taken together may have a significant impact on global climate change.

A numerical threshold for determining the significance of greenhouse gas emissions in the South Coast Air Basin has not been established by the South Coast Air Quality Management District. The City of Jurupa Valley is using the following as interim thresholds for residential projects:

1) Generate greenhouse gas emissions that exceeds the South Coast Air Quality Management District's project-level efficiency target of 4.8 metric tons of carbon dioxide equivalent (MTCO2e) per service population (Service population is defined as the sum of the residential population and employees; a development's GHG emissions are divided by the service population to yield a GHG efficiency metric that is presented in terms of "metric tons of CO_2e per service population per year"; or

2) Generate greenhouse gas emissions that exceeds a screening threshold of 3,000 MTCO2e per year. Residential projects that emit less stationary source greenhouse gas emissions less than 3,000 MTCO2e per year are not considered a substantial greenhouse gas emitter and the impact is less than significant. Projects that emit in excess of 3,000 MTCO2e per year require additional analysis and mitigation.

6.7(a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Finding: Less-than-Significant Impact

(Sources: Greenhouse Gas Analysis, 2014c)

GHG emissions associated with the proposed Project would primarily be associated with Project-related traffic. In addition, Project-related construction activities, energy consumption, water consumption, and solid waste generation also would contribute to the Project's overall generation of GHG gasses. As previously noted, the City of Jurupa Valley has not adopted any numerical thresholds of significance for GHG emissions. Nevertheless, the City is applying compliance with AB

32 and the SCAQMD's draft project-level efficiency target of 4.8 MT per service population to determine significance for this Project.

The quantified analysis is the factual basis for the City's determination regarding the effect of Project-related GHG emissions. The analysis is specific to this Project, and may not necessarily apply to other projects within the City of Jurupa Valley. A summary of the proposed Project's projected annual operational GHG emissions, including amortized construction-related emissions, is provided in Table 6-7, *Total Annual Project Greenhouse Gas Emissions*. As shown, the Project is estimated to emit approximately 5,026.5 MTCO2e per year, including amortized construction-related emissions, or approximately 3.47 MTCO2e per service population. For more information, refer to *Technical Appendix H*. Emissions of 3.47 MTCO2e per service population is below the SCAQMD's draft project-level efficiency target of 4.8 MT per service population; thus, the Project's volume of GHG emissions would be less than significant.

Table 6-7 Total Annual Project Greenhouse Gas Emissions

Emission Source	Emissions (metric tons per year)			
	CO_2	**CH_4**	**N_2O**	**Total CO_2E**
Annual construction-related emissions amortized over 30 years	55.14	0.006	--	55.27
Area	102.04	8.70e-3	1.75e-3	102.77
Energy	726.70	0.03	0.01	730.48
Mobile Sources	3,893.35	0.16	--	3,896.70
Waste	37.07	2.19	--	83.08
Water Usage	133.52	0.85	0.02	157.95
Total CO_2E (All Sources)	**5,026.25**			
Service Population	**1,450[1]**			
MT CO_2E/Service Population (SP)/Yr	**3.47**			
Threshold MT CO_2E/SP/Yr	**4.8**			
Significant?	**NO**			

Source: Urban Crossroads, 2014d (See Appendix 3.1 for detailed CalEEMod™ model outputs)
Note: Totals obtained from CalEEMod™ and may not total 100% due to rounding.
Table results include scientific notation. *e* is used to represent *times ten raised to the power of* (which would be written as x 10^{b}") and is followed by the value of the exponent.

[1] Population calculated using an average of 3.65 persons per dwelling unit (U.S. Census Bureau, American Community Survey 2008-2012*)*

6.7(b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Finding: Less-than-Significant Impact

AB 32 requires California to reduce its GHG emissions to 1990 levels by the Year 2020. CARB identified emissions reduction measures to achieve this goal as set forth in the CARB Scoping Plan. Thus, projects that are consistent with the CARB Scoping Plan are also consistent with AB 32's mandate to reduce GHG emissions. A discussion of the Project's consistency with each applicable CARB recommend action is presented in the Greenhouse Gas Analysis prepared for the Project (see *Technical Appendix E*). As discussed therein, the Project is consistent with, or otherwise would not conflict with, the recommended measures from the CARB Scoping Plan.

In addition, activities associated with the Project would be required to comply with all mandatory regulatory requirements imposed by the State to directly or indirectly reduce GHG emissions, including, but not limited to:

- Global Warming Solutions Act of 2006 (AB32)
- Regional GHG Emissions Reduction Targets/Sustainable Communities Strategies (SB 375)

There are no other plans, policies, or regulations that have been adopted for the purpose of reducing the emissions of GHGs that are applicable to the proposed Project.

Because the proposed Project would be consistent with the CARB Scoping Plan and also would be below SCAQMD's draft project-level efficiency target of 4.8 MT per service population, Project-related GHG emissions would not be substantial and would not directly or indirectly result in a significant, cumulatively considerable impact on the environment. Therefore, the proposed Project would result in a less-than-significant significant impact to the environment as a result of Project-related GHG emissions.

Mitigation

Although impacts associated with greenhouse gas emissions would be less than significant, the following mitigation measures are recommended to ensure compliance with regulatory permitting requirements.

> **Mitigation Measure GG-1:** Prior to building permit issuance, the City shall verify that the following note is included on building plans. Project contractors shall be required to ensure compliance with the note and permit inspection by City of Jurupa Valley staff or its designee to ensure compliance. The note also shall be specified in bid documents issued to prospective construction contractors.
>
> a. All installed appliances shall comply with California Code of Regulations Title 20 (Appliance Energy Efficiency Standards), which establishes energy efficiency requirements for appliances.

Mitigation Measure GG-2: Prior to the approval of landscaping plans, the City shall verify that the landscaping will comply with City Ordinance No. 859, "Water Efficient Landscape Requirements." Project contractors shall be required to ensure compliance with approved landscaping plans.

Mitigation Measure GG-3: Prior to issuance of the first building permit, the Project Applicant shall submit energy usage calculations in the form of a Title 24 Compliance Report to the City of Jurupa Valley Planning Department showing that the Project will be constructed to achieve the building energy efficiency standards set forth in the California Code of Regulations Title 24 requirements in effect at the time of building permit issuance. Prior to issuance of the first building permit, the City shall review and approve the Report. Any combination of design features may be used to fulfill this mitigation measure, including but not limited to, the following:

a. Increasing insulation such that heat transfer and thermal bridging is minimized;
b. Limiting air leakage through the structure and/or within the heating and cooling distribution system;
c. Using energy-efficient space heating and cooling equipment;
d. Installing dual-paned or other energy-efficient windows;
e. Using interior or exterior energy-efficient lighting;
f. Installing automatic devices to turn off lights where they are not needed;
g. Applying paint and a surface color palette that emphasizes light and off-white colors that reflect heat away from buildings;
h. Designing buildings with "cool roofs" using products certified by the Cool Roof Rating Council, and/or exposed roof surfaces using light and off-white colors;
i. Designing buildings to accommodate photo-voltaic solar electricity systems or installation of photo-voltaic solar electricity systems;
j. Installing Energy Star-rated appliances.

6.8 HAZARDS AND HAZARDOUS MATERIALS

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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 Section 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 or, where such a plan has not been adopted, within two miles of a public airport or 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?				✓

Impact Analysis

6.8(a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Finding: Less-than-Significant Impact

(Sources: Phase I Environmental Site Assessment, 2014)

❑ **Impact Analysis for Existing Site Conditions**

A Phase I Environmental Site Assessment was conducted on the Project site by PIC Environmental Services (PIC) to assess the existing conditions of the property. Refer to *Technical Appendix F* for additional information. Based on PIC's site inspection and review of historic aerial photographs, the site was initially used for agricultural purposes but has not been used for agricultural cultivation since the 1930's (PIC, August 2014). Given the several decades of time that has passed, any prior organochlorine pesticide residues remaining from the active farming period would have decayed to non-hazardous levels (PIC, August 2014). Aerial photographs reviewed by PIC indicate that dumping of nonhazardous construction debris in the southeast corner of the site commenced after 2006. The Project site contains no structural improvements and remains unpaved. Because the site contains no structural improvements, asbestos containing construction materials (ACM) are not anticipated to be present on the site. During their site investigation, PIC observed no obvious ACM. PIC observed a large amount of non-hazardous construction debris (broken concrete, asphalt, bricks) in the southeastern portion of the property. PIC observed no evidence of underground storage tanks (USTs,), clarifiers, stressed vegetation, significant surface staining or drains exhibiting stains. In summary, PIC observed no evidence of Recognized Environmental Conditions (environmental impairments) during their site inspection.

None of the adjacent properties observed by PIC exhibited obvious evidence of hazardous materials contamination. In addition, the Environmental Data Resources (EDR) records search conducted by PIC does not contain documentation of significant environmental impairments on any adjoining properties (refer to *Technical Appendix F* for the EDR Report). As such, a significant hazard to the public or the environment would not be created as a result of the Project associated with existing site conditions, and impacts would be less than significant.

❑ **Impact Analysis for Temporary Construction-Related Activities**

Heavy equipment (e.g., dozers, excavators, tractors) would be operated on the subject property and on the parcel to the immediate north during construction of the Project. This heavy equipment would likely be fueled and maintained by petroleum-based substances such as diesel fuel, gasoline, oil, and hydraulic fluid, which is considered hazardous if improperly stored or handled. In addition, materials such as paints, adhesives, solvents, and other substances typically used in building construction would be located on the Project site during construction. Improper use, storage, or transportation of hazardous materials can result in accidental releases or spills, potentially posing health risks to workers, the public, and the environment. This is a standard risk on all construction sites, and there would be no greater risk for improper handling, transportation, or spills associated with the proposed Project than would occur on any other similar construction site. Construction

contractors would be required to comply with all applicable federal, state, and local laws and regulations regarding the transport, use, and storage of hazardous construction-related materials, including but not limited requirements imposed by the Environmental Protection Agency (EPA), California Department of Toxic Substances Control (DTSC), South Coast Air Quality Management District (SCAQMD), Santa Ana Regional Water Quality Control Board (RWQCB).

- **Impact Analysis for Long-Term Operational Activities**

The Project site would be developed with residential apartment uses including but not limited to 25 apartment buildings housing 397 apartment units, a clubhouse, pool, and fitness area, which are land uses not typically associated with the transport, use, or disposal of hazardous materials. Although residential land uses may utilize household products that contain toxic substances, such as cleansers, paints, adhesives, and solvents, these products are usually in low concentration and small in amount and would not pose a significant risk to humans or the environment during transport to/from or use at the Project site. Pursuant to State law and local regulations, residents would be required to dispose of household hazardous waste (e.g., batteries, used oil, old paint) at a permitted household hazardous waste collection facility. Accordingly, the Project would not expose people or the environment to significant hazards associated with the disposal of hazardous materials at the Project site. Long-term operation of the Project would not expose the public or the environment to significant hazards associated with the transport, use, or disposal of hazardous materials and impacts would be less than significant.

6.8 (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?

Finding: Less than Significant Impact

(Sources: Phase I Environmental Site Assessment, 2014)

As mentioned previously in Item 6.8 (a) during PIC's site inspection, no REC's were observed on the property. In addition, none of the adjacent properties observed by PIC exhibited obvious evidence of hazardous materials contamination. In addition, the EDR records search does not contain documentation of significant environmental impairments on any adjoining properties (refer to *Technical Appendix F* for the EDR Report). Therefore, an accidental release of hazardous materials during grading and site development is not anticipated. In addition, accidents involving hazardous materials that could pose a significant hazard to the public or the environment would be highly unlikely during the construction and long-term operation of the Project and are not reasonably foreseeable. As discussed above under Section 6.8(a), the transport, use and handling of hazardous materials on the Project site during construction is a standard risk on all construction sites, and there would be no greater risk for upset and accidents than would occur on any other similar construction site. Upon buildout, the Project site would operate as a residential apartment community, which is a land use type not typically associated with the transport, use, or disposal of hazardous materials that could be subject to upset or accident involving the release of hazardous materials into the environment. As such, impacts associated with the accidental release of hazardous materials into the environment would be less than significant during long-term operation of the Project.

6.8(c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Finding: Less-than-Significant Impact

(Sources: Phase I Environmental Site Assessment, 2014; Google Earth)

The Louis VanderMolen Elementary School, located east of the Project site at the corner of 68th Street and Carnelian Street, is located within 0.25-mile of the Project site. No other schools are located or proposed within 0.25-mile of the Project site. Construction activities would be managed through routine control measures to prevent a release of hazardous substances, as discussed under the response to Issue 6.8(a). As further noted under the response to Issue 6.8(a), long-term operation of the Project site would not involve the emission or handling of hazardous materials that could pose a significant hazard to people or the environment, including the school. As such, Project operation would result in a less than significant impact.

6.8(d) 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, would it create a significant hazard to the public or the environment?

Finding: No Impact

(Sources: Phase I Environmental Site Assessment, 2014)

A review of the databases compiled by the State of California pursuant to Government Code Section 65962.5 was conducted as part of the Phase I Environmental Site Assessment (refer to *Technical Appendix F*). This review determined that the Project site is not included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. No impact would occur.

6.8(e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

Finding: No Impact

(Sources: City of Jurupa Valley General Plan, Figure 4, Eastvale Area Plan Policy Areas; City of Jurupa Valley General Plan, Figure 5, Eastvale Area Plan Chino Airport Influence Area; RCLIS; Google Earth)

The Project site is not located within the influence area of any airport land use plan, nor is the Project site located within two (2) miles of any public airport or public use airport. Accordingly, the Project has no potential to expose future residents in the Project area to airport-related safety hazards. No impact would occur.

6.8(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?

Finding: No Impact

(Sources: City of Jurupa Valley General Plan, Figure S-19 – Airport Locations; Riverside County Airport Land Use Compatibility Plan, 2004; Google Earth)

There are no private airfields or airstrips in the vicinity of the Project site. Accordingly, the Project has no potential to expose future residents in the Project area to airport-related safety hazards. No impact would occur.

6.8(g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Finding: Less-than-Significant Impact

(Sources: City of Jurupa Valley General Plan, Safety Element; Project Application Materials)

The Project site does not contain any emergency facilities nor does it serve as an emergency evacuation route. During construction and long-term operation, the proposed Project would be required to maintain adequate emergency access for emergency vehicles via 68th Street and connecting on-site roadways as required by the City. As noted in the response to Checklist item 6.17(e), both Project driveways would be equipped with electronically activated gates, as a security measure to restrict access. Project residents and property management personnel would be provided with electronic remote control devices for entry and exit. Emergency responders would have access via a "Knox Box" where master keys to open the gates electronically, or manually in the case of an electronic malfunction, would be provided within a secured location on-site. Furthermore, the Project would not result in a substantial alteration to the design or capacity of any public road that would impair or interfere with the implementation of evacuation procedures. Because the Project would not interfere with an adopted emergency response or evacuation plan, impacts are less than significant.

6.8(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?

Finding: No Impact

(Sources: City of Jurupa Valley General Plan, Figure 9, Eastvale Area Plan Wildfire Susceptibility; RCLIS; Google Earth)

The Project site is not located within a Hazardous Fire Area as mapped by the Riverside County Land Information System (RCLIS). According to the City of Jurupa Valley General Plan Figure 9, Eastvale Area Plan Wildfire Susceptibility, the Project site is not identified as being located within a wildfire zone. With the exception of the vacant undeveloped land directly north of the Project site planned for Light Industrial (LI) and Public Facilities (PF), the proposed Project is located in an area that is largely developed and does not contain any wildlands. The Project site is bounded on the

south, east, and west by roadways. The Project site is bounded on the south by 68th Street. Located to the south of 68th Street is land currently used for agricultural purposes (field crop cultivation) that is approved for the future development of 464 single-family residential homes and a public park (the "Riverbend" community). Located to the west of the Project site is the I-15 Freeway. Located west of I-15 are single-family detached homes in the City of Eastvale. The Project site is bounded on the west by Pats Ranch Road. Located to the east of Pats Ranch Road are single-family detached homes. To the east of the single-family detached homes is Louis Vandermolen Fundamental Elementary School.

Because the Project site is located in a developed area and there are no wildlands near the site, implementation of the proposed Project would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires. No impact would occur.

6.9 HYDROLOGY AND WATER QUALITY

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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 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, which would result in flooding on- or off-site?			✓	
e. Create or contribute runoff which would exceed the capacity of existing or planned storm water 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 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, which 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 the failure of a levee or dam?				✓
j. Inundation by seiche, tsunami, or mudflow?				✓

Impact Analysis

6.9(a) Violate any water quality standards or waste discharge requirements?

Finding: Less-than-Significant Impact

(Sources: Project Specific Water Quality Management Plan (WQMP), 2014; Santa Ana River Basin Water Quality Control Plan, 2008; One Water, One Watershed Plan 2.0, 2014)

The California Porter-Cologne Water Quality Control Act (Section 13000 ("Water Quality") et seq., of the California Water Code), and the Federal Water Pollution Control Act Amendment of 1972 (also referred to as the Clean Water Act (CWA)) require that comprehensive water quality control plans be developed for all waters within the State of California. The Project site is located within the jurisdiction of the Santa Ana Regional Water Quality Control Board (RWQCB). Water quality information for the Santa Ana River is contained in the Santa Ana RWQCB's Santa Ana River Basin Water Quality Control Plan (updated February 2008) and the Integrated Regional Water Management Plan (IRWMP) for the Santa Ana River Watershed (also referred to as "One Water One Watershed," dated February 4, 2014), prepared by the Santa Ana Watershed Project Authority. These documents are herein incorporated by reference and are available for public review at the Santa Ana RWQCB office located at 3737 Main Street, Suite 500, Riverside, CA 92501.

The CWA requires all states to conduct water quality assessments of their water resources to identify water bodies that do not meet water quality standards. Water bodies that do not meet water quality standards are placed on a list of impaired waters pursuant to the requirements of Section 303(d) of the CWA. The Project site resides within the Santa Ana River Watershed, Region 8. Receiving waters for the property's drainage are the Santa Ana River Reaches 3, 2, and 1, which discharge into the Pacific Ocean, and the Prado Basin Area. The Santa Ana River Reach 3 is 303(d) impaired by copper, pathogens, and lead and Reach 2 is impaired by indicator bacteria. Before discharging into the Pacific Ocean approximately 43 miles west of the Project site, the tidal prism of the Santa Ana River and Newport Slough is impaired by pathogens.

A specific provision of the CWA applicable to the proposed Project is CWA Section 402, which authorizes the National Pollutant Discharge Elimination System (NPDES) permit program that covers point sources of pollution discharging to a water body. The NPDES program also requires operators of construction sites one acre or larger to prepare a Stormwater Pollution Prevention Plan (SWPPP) and obtain authorization to discharge stormwater under an NPDES construction stormwater permit.

❑ **Impact Analysis for Construction-Related Water Quality**

Construction of the proposed Project would involve demolition, clearing, soil stockpiling, grading, paving, utility installation, building construction, and landscaping activities, which would result in the generation of potential water quality pollutants such as silt, trash, debris, chemicals, paints, and other solvents with the potential to adversely affect water quality. As such, short-term water quality impacts have the potential to occur during construction of the Project in the absence of any protective or avoidance measures.

Pursuant to the requirements of the Santa Ana RWQCB and the City of Jurupa Valley, the Project would be required to obtain a National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit for construction activities. The NPDES permit is required for all projects that include construction activities, such as clearing, soil stockpiling, grading, and/or excavation that disturb at least one acre of total land area. In addition, the Project would be required to comply with the Santa Ana RWQCB's Santa Ana River Basin Water Quality Control Program. Compliance with the NPDES permit and the Santa Ana River Basin Water Quality Control Program involves the preparation and implementation of a SWPPP for construction-related activities, including grading and soil stockpiling. The SWPPP would specify the Best Management Practices (BMPs) that the Project would be required to implement during construction activities to ensure that all potential pollutants of concern are prevented, minimized, and/or otherwise appropriately treated prior to being discharged from the subject property. Mandatory compliance with the SWPPP would ensure that the proposed Project does violate any water quality standards or waste discharge requirements during construction activities. Therefore, water quality impacts associated with construction activities would be less than significant and no mitigation measures would be required. Nonetheless, mitigation measure H-1 is recommended to ensure that the SWPPP incorporates specific erosion control measures for the adjacent off-site soil export area. This measure is already included in the proposed grading plan.

> **Mitigation Measure H-1:** During grading and ground-disturbing activities, the construction contractor shall ensure that the offsite export area is contour graded between the northern property line and the RCFCD storm drain easement in a manner which would perpetuate the existing drainage pattern. The construction contractor shall ensure that slopes are graded at or less than 3:1, and permanent erosion measures (the use of soil binders, and/or hydroseeding with native plants and vegetation) be implemented as soon as possible following placement of the exported soils on the adjacent offsite export area.

- **Post Development Water Quality Impacts**

Storm water pollutants commonly associated with the land uses proposed by the Project (i.e., apartment buildings, asphalt-paved parking and vehicle circulation areas, dog park, landscaping and a clubhouse/fitness center) include sediment/turbidity, nutrients, trash and debris, oxygen-demanding substances, organic compounds, bacteria and viruses, oil and grease, pesticides, and metals. Based on current receiving water impairments (303(d) List) and allowable discharge requirements (USEPA TMDL List), the Project's pollutants of concern are pathogens (bacteria and viruses), nutrients/low dissolved oxygen, pesticides, sediments, trash and debris and oil and grease. To meet NPDES requirements, the proposed storm drain system is designed to route first flush runoff (85th percentile) to an underground infiltration basin located in the southwestern part of the site, just prior to discharging to an existing underground storm drain structure that runs along the western site boundary. This basin has been sized to treat the entire Project's first flush volumes, and contains filtration mechanisms designed to capture the range of pollutants anticipated to be present in the developed site runoff. Infiltration basin calculations are included in The Project's Water Quality Management Plan (WQMP) contained as *Technical Appendix G2* (refer to its Section D.5 for calculations).

Furthermore, the Project would be required to implement its WQMP, pursuant to the requirements of the City's NPDES permit. The WQMP is a post-construction management program that ensures the on-going protection of the watershed basin by requiring structural and operational controls. The Project's preliminary WQMP has been prepared and is included as *Technical Appendix G2*. The WQMP identifies structural controls (including an underground infiltration basin) and operational controls (including educational materials for property owners, "good housekeeping" practices such as litter control and regular sweeping of driveways and parking areas, maintaining and marking inlets, etc.) to minimize, prevent, and/or otherwise appropriately treat storm water runoff flows before they are discharged from the site. Mandatory compliance with the WQMP would ensure that the Project does violate any water quality standards or waste discharge requirements during long-term operation. Therefore, water quality impacts associated with post-development activities would be less than significant and no mitigation measures would be required.

Although impacts associated with adherence to water quality standards would be less than significant, the erosion control measures specified in Mitigation Measures GE-3, GE-4, and GE-5 are recommended to ensure compliance with applicable regulatory requirements related to water quality.

6.9(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)?

Finding: Less-than-Significant Impact

(Sources: Project Application Materials; Drainage Study Report, 2014)

No potable or non-potable groundwater wells are proposed as part of the Project. The proposed Project would be served with potable water by the JCSD, via the existing 18-inch water line located in Pats Ranch Road. JCSD's domestic water supplies are reliant on groundwater from the Chino Groundwater Basin as a primary source (the Project site is located in the southern portion of the Chino Groundwater Basin). All municipal water entities that exceed their safe yield incur a groundwater replenishment obligation, which is used to recharge the groundwater basin with State Water Project Water. Thus, the Project's demand for domestic water service would not 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. For more detailed information about domestic water supply refer to the Utilities and Service Systems discussion under Issue 6.17(d).

Development of the Project would increase impervious surface coverage on the site to approximately 75% of the site area, which would in turn reduce the amount of direct infiltration of runoff into the ground. This would have a less than significant impact on groundwater recharge in the areas of the Chino Groundwater Basin that are managed for that purpose, since those recharge areas do not encompass the Project site. Therefore, impacts to groundwater supplies and recharge would be less than significant, and mitigation would not be required.

6.9(c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of stream or river, in a manner, which would result in substantial erosion or siltation on- or off-site?

Finding: Less-than-Significant Impact

(Sources: Project Application Materials; Drainage Study Report, 2014)

There are no stream courses or other established natural surface drainages within the Project site or on the adjacent soil export site. Runoff currently sheet flows in several directions, due to the undulating topography of the soil piles and grade differences across the site, but predominantly from north to south. Surface flow on site is currently collected by one storm drain inlet located approximately 440 feet north of 68th Street and 50 feet east of the I-15 Freeway right-of-way. This storm drain flows into a RCFCWCD underground reinforced concrete box structure (Line "J") that runs along the western site boundary. Implementation of the Project would include the installation of a stormwater drainage system in the developed areas of the property, which would discharge to an underground infiltration basin in the southwestern part of the site. Runoff would be released from the basin to an existing RCFCWCD underground drainage structure that runs along the western site boundary.

As noted in the response to 6.9(a), placement of soil export materials on the adjacent property to the north will be accomplished with contour grading to maintain the existing drainage pattern, and that the 3:1 slope created in that area is promptly treated with erosion control such as hydroseeding with a native plant mix and/or use of soil binders. With buildout of the proposed Project, approximately 75% of the ground surface would become impervious, preventing any soil erosion, and the rest of the site would be covered with landscaping that would prevent erosion in those areas. Additionally, all runoff from the developed portions of the property would be treated by an infiltration basin that would remove sediment that might be present in runoff from landscape areas, prior to discharge to the RCFCWCD drainage structure. With buildout of the proposed Project, there would be no significant alteration of the site's existing drainage pattern and there would not be any significant increases in the rates of erosion or siltation on or off site. No mitigation would be required.

6.9(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, which would result in flooding on- or off-site?

Finding: Less-than-Significant Impact

(Sources: Project Application Materials; Drainage Study Report, 2014)

As discussed above in Issue 6.9(c), there are no natural drainage courses on the Project site and the site's general drainage pattern would be maintained, but captured and controlled within an on-site, underground storm drain system.

With buildout of the proposed Project, site runoff would increase from 11.1 to 29.3 cubic feet per second (cfs) in the 10-year storm event, a 163% increase. Developed site runoff would increase runoff during the 100-year storm from 32.5 cfs to 47.6 cfs, an increase of 46.5%. The on-site storm drain facilities are designed to infiltrate the low flows (2 year, 24-hour storm event), which are represented as the Design Capture Volume. The larger flows (10 year and 100-year storm events) would discharge into the RCFCWCD Day Creek Master Drainage Plan (MDP) Line "J" facility along the western site boundary. This reinforced concrete box structure was designed to accept and convey storm water from developed conditions for all areas that are tributary to it, which includes the Project site. (Ardery, October 2014) The proposed on-site storm drain system would provide adequate flood protection for the proposed residential uses for a 100 year-one hour duration storm event and would prevent flooding from site runoff outside of the Project site. Project-related impacts would be less than significant.

6.9(e) Create or contribute runoff which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?

Finding: Less-than-Significant Impact

(Sources: Project Application Materials; Drainage Study Report, 2014)

As noted in the preceding response to item 6.9(d), all of the developed site runoff would be discharged into the existing RCFCWCD concrete box drainage structure (Line "J") along the western site boundary. That drainage structure was designed to accept and convey runoff from developed sites throughout its tributary area, which includes the Project site. The added runoff from the developed site would not exceed the capacity of that regional drainage facility, and the Project's impact would be less than significant. (Ardery, November 2014).

Additionally, with required adherence to a SWPPP and WQMP as discussed above under Issue 6.9(a), the Project would not provide substantial additional sources of polluted runoff. Therefore, a less-than-significant impacts would occur and mitigation is not required.

6.9(f) Otherwise substantially degrade water quality?

Finding: No Impact

(Source: Project Application Materials)

There are no conditions associated with the proposed Project that could result in the substantial degradation of water quality beyond what is described above in the responses to Issues 6.9(a), 6.9(c), and 6.9(e). No impact would occur.

6.9(g) Place housing within a 100-year flood hazard as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

Finding: No Impact

(Sources: Project Application Materials; Federal Emergency Management Agency (FEMA) Letter of Map Revision (LOMR), October 20, 2014; City of Jurupa Valley General Plan; Drainage Study Report, 2014)

At the time the Eastvale Area Plan was completed, in 2003, much of the Project site was within a100-year flood hazard area, as designated in Flood Insurance Rate Map No. 06065C0683G, prepared by the Federal Emergency Management Agency (FEMA). Since that time, the RCFCWCD built its Day Creek Line "J", a regional drainage structure that accepts runoff from a tributary area that includes the Project site, and lands upstream of the Project site. In October 2014, the FEMA issued a Letter of Map Revision (LOMR) to document its finding that the Line "J" structure will contain the 100-year flood flows, thus eliminating the sheet flow flooding that previously affected the Project site and adjacent upstream land. (FEMA, 2014). As a result, the Project site is no longer within a FEMA-designated 100-year flood hazard zone and the Project would have no impact involving placement of housing within a flood hazard zone.

Mitigation

No mitigation is required.

6.9(h) Place within a 100-year flood hazard area structures, which would impede or redirect flood flows?

Finding: No Impact

(Sources: Project Application Materials; FEMA LOMR, October 20, 2014;Drainage Study Report, 2014)

As previously discussed in Issue 6.9(g), the Project site is not within a 100-year flood hazard zone; therefore, the proposed development would not impede or redirect flood flows and there would be no impact.

Mitigation

No mitigation is required.

6.9(i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

Finding: No Impact
(Sources: Project Application Materials; Drainage Study Report, 2014; Eastvale Area Plan)

The Eastvale Area Plan, prepared as part of the comprehensive Riverside County General Plan before the City of Jurupa Valley was incorporated, identifies flood prone areas on lands adjacent to the Santa Ana River, and some areas parallel to Wineville Road and I-15, including the Project site. Please refer to the discussion under Issue 6.9(g), which indicates that the Project site is not within a FEMA-mapped flood hazard zone. With existing elevations above 612 feet and proposed elevations at 619 feet or above, the Project site is outside of the potential dam inundation area associated with the Prado Dam, which affects lands downstream of the dam below an elevation of 566 feet. (Ardery, November 2014)

Mitigation
No mitigation is required.

6.9(j) Inundation by seiche, tsunami, or mudflow?

Finding: No Impact

(Source: Google Earth)

The Pacific Ocean is located more than 30 miles from the Project site; consequently, there is no potential for tsunamis to impact the Project. In addition, no steep hillsides subject to mudflow are located on or near the Project site. The nearest large body of surface water to the site is Lake Mathews, located approximately 9.0 miles southeast of the Project site. Due to the distance of Lake Mathews from the Project site and the topographic characteristics of the area, a seiche in Lake Mathews would have no impact on the Project site. Therefore, the Project site would not be subject to inundation by a seiche, mudflow, and/or tsunami; no impact would occur.

Mitigation

No mitigation is required.

6.10 LAND USE AND PLANNING

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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?		✓		

Impact Analysis

6.10(a) Physically divide an established community?

Finding: No Impact

(Sources: Project Application Materials; Site Field Survey, 2014; Google Earth)

Under existing conditions, the Project site is vacant, undeveloped land that is devoid of any buildings or other structures and no site improvements. The eastern half has been used for soil stockpiling from a variety of sources.

To the west of the Project site is the I-15 Freeway, beyond which are medium-density, detached residential homes in the City of Eastvale. I-15 forms a physical barrier between the Project site and the City of Eastvale. To the east of the Project site, on the east side of Pats Ranch Road, is the residential community of Township Place, which is comprised of several distinctive neighborhoods of single family homes. Because the homes in the City of Eastvale and the Township Place community do not collectively function as an established community and are physically divided by the Project site and I-15, the proposed Project has no potential to create an east to west division of an established community. To the contrary, development of the Project site with the proposed apartment community would fill a gap in the development pattern, which could add to a sense of connectedness among other surrounding developments.

Immediately to the north of the Project site is vacant land, and that is bordered on the north by the Vernola Marketplace, a community-scale shopping center at the southwest corner of Limonite Avenue and Pats Ranch Road. Undeveloped, fallow agricultural land is directly south of the Project site, between 68th Street and the Santa Ana River. That land area has an approved residential community master plan known as "Riverbend." The Project would thus serve as a continuation of

development patterns to the north and south and has no potential to create a north to south division of an established community. Development of the Project site north of 68th Street would fill in a vacant parcel with another residential use that would expand a growing concentration of residential uses in this area. As such, no impact would occur.

Mitigation

None required.

6.10(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?

Finding: Less-than-Significant Impact

(Sources: Project Application Materials; City of Jurupa Valley General Plan)

Under existing conditions, the Project site is designated in the Jurupa Valley General Plan and the I-15 Corridor Specific Plan as IP-Industrial Park. With this designation, a variety of industrial and related uses such as warehousing/distribution, light manufacturing/assembly, repair and maintenance, and supporting retail uses could be developed, at a land use intensity of 0.25 to 0.6 FAR (floor area ratio). With a FAR of 0.5, approximately 378,972 square feet of building area could be developed. A General Plan Amendment is proposed to change the designation of this property to Highest Density Residential (HHDR), which would allow for development of multi-family uses at a density of 20+ dwelling units per acre. A corresponding change of zone is proposed to reclassify the site as R-3 General Residential. The proposed Project would implement these new designations through a development plan that consists of an apartment complex with 397 residential units.

Although the proposed Project would be inconsistent with the existing General Plan land use and Zoning designations for the Project site, such an inconsistency would only be significant if it were to result in significant, adverse physical effects to the environment. The City's existing land use policies and regulations for this site are intended to foster an economic development of the land, not to preserve any natural resources, protect environmentally sensitive lands or biological resources, or restrict or prohibit development due to the presence of a significant natural or man-made hazard. No such environmental sensitivities have been identified on this site through any of the environmental assessments prepared for this IS/MND. As disclosed in this IS/MND, implementation of the proposed Project would develop the subject property at a higher intensity than allowed under the existing General Plan and Zoning designations and would result in adverse effects to the environment. However, in all instances where significant impacts have been identified, mitigation is provided to reduce each impact to less-than-significant levels. Therefore, because the Project is processing a GPA and CZ to modify the site's underlying land use regulations to be consistent with those proposed by the Project and because implementation of the Project would not result in significant impacts to the environment, the Project's inconsistency with the site's existing underlying General Plan land use and Zoning designations represents a less-than-significant impact for which no mitigation would be required.

Mitigation

None required.

6.10(c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

Finding: Less- than- Significant Impact with Mitigation Incorporated

(Sources: Biological Technical Report, 2014).

As noted in the response to Item 6.4(f), the Project site is located within the boundaries of the "Western Riverside County Multiple Species Habitat Conservation Program (MSHCP)." The site is not within an MSHCP Criteria Area and is not targeted for conservation by the MSHCP to meet Reserve Assembly goals. A biological survey and assessment of the site and the parcel to the north that would be used as a receiving site for the Project's exported earth materials found that there is no habitat that supports any rare, threatened or endangered species of plants or animals and no sign of any such species, except for burrowing owl. Mitigation Measure BR-1 will require a pre-construction biological survey to determine if burrowing owl is present in the Project's disturbance area and if so, to implement active or passive relocation of owls to suitable habitat off site, in accordance with the provisions of the MSHCP and the protocols established by the CDFW. The biological survey found no riparian/riverine or vernal pools habitat on site, and determined that there is no suitable habitat for any of the narrow endemic plant species known to occur in this part of the MSHCP area. The proposed Project would not conflict with any provisions of the MSHCP and is consistent with the MSHCP.

Mitigation

BR-1 shall apply.

6.11 MINERAL RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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?				✓

Impact Analysis

6.11(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?

Finding: No Impact

(Sources: City of Jurupa Valley General Plan, Figure OS-5, "Mineral Resources"; Riverside County General Plan Program EIR, 2003, Chapter 4.12 – Mineral Resources; Google Earth; California Geological Survey)

No mines, oil or gas wells, or other resource extraction activity occurs on the property or is known to have ever occurred on the property. The Project site is not located within an area known to be underlain by regionally- or locally-important mineral resources, or within an area that has the potential to be underlain by regionally- or locally-important mineral resources, as disclosed by the City's General Plan and the associated General Plan FEIR. In addition, according to mapping conducted by the California Geological Survey (CGS), which maps areas known as Mineral Resource Zones (MRZs), the Project site is mapped MRZ-3 which is defined by the CGS as areas containing known or inferred mineral occurrences of undetermined mineral resources significance. Accordingly, implementation of the proposed Project would not result in the loss of availability of a known mineral resource that would be of value to the region or the residents of the State of California. No impact to significant mineral resources would occur.

Mitigation

No mitigation is required.

6.11(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?

Finding: No Impact

(Sources: City of Jurupa Valley General Plan, Figure OS-5, "Mineral Resources"; Riverside County General Plan Program EIR, 2003, Chapter 4.12 – Mineral Resources; Google Earth)

Refer to the response to Item 6.11(a), above. The City's General Plan does not identify any locally-important mineral resource recovery sites on-site or within close proximity to the Project site, nor are any mineral resource recovery operations located on-site or in the surrounding area. The City's General Plan does not identify the Project site as containing a locally important mineral resource recovery site. As such, no impact would occur.

Mitigation

No mitigation is required.

6.12 NOISE

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or 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 or, where such a plan has not been adopted, within two miles of a public airport or 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?				✓

Impact Analysis

6.12(a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Finding: Less-than-Significant Impact with Mitigation Incorporated

(Sources: Noise Impact Analysis (Urban Crossroads 2014d); Ordinance No. 847)

Under existing conditions, the property is vacant undeveloped land that contains no structural improvements. Therefore, there are no known unusual or loud noises that originate from the property on a regular basis. Primary noise sources near the site include traffic noise from I-15 and 68th Street. For more information about the existing noise environment surrounding the Project site, refer to Section 5 of the Project's Noise Impact Analysis (see *Technical Appendix H)*. Development of the Project site as an apartment community has the potential to expose persons to or result in elevated noise levels during both near-term construction activities and under long-term

operation of the Project. Near-term (i.e. temporary) and long-term (i.e. permanent) noise impacts associated with the Project are discussed below.

- **Impact Analysis for Near-Term Construction Noise**

The City's Noise Ordinance (Ordinance No. 847) includes a provision that exempts construction activities from any maximum noise level standard, provided that construction activities occur between the hours of 6:00 a.m. to 6:00 p.m. during the months of June through September or 7:00 a.m. to 6:00 p.m. during the months of October through May. Although the Project is required to comply with the City's Noise Ordinance to ensure that construction-related noise only occurs during the daytime hours permitted by the Ordinance, when construction noise is considered to be exempt from the regulatory provisions of the Ordinance, an assessment of construction-related noise impacts was nonetheless conducted by Urban Crossroads and is summarized herein.

Off-Site Non-Transportation-Related Noise Impacts (Stationary Noise)

To assess short-term construction noise, Urban Crossroads identified 11 representative noise receiver locations. As indicated on Figure 6-1, *Noise Receiver Locations*, sensitive receivers in the vicinity of the Project site include residential land uses located to the west and east of the Project site at receiver locations identified as R1, R7, R9, and R10. The closest existing noise-sensitive receiver is receiver location R7, which is located approximately 138 feet east of the Project site. Receiver location R11, located approximately 113 feet south of the Project site, represents an existing vacant lot that is zoned for residential use. (Urban Crossroads, 2014d, pp. 59-60)

Regardless of the Project's consistency with the City's noise ordinance as described above, construction activities on the Project site, especially those involving heavy equipment, would initially create intermittent, short-term noise increases in the vicinity of the Project site, representing a temporary effect on ambient noise levels. Noise generated by construction equipment, including trucks, graders, bulldozers, concrete mixers, and portable generators, can reach high levels. The projected noise levels used for analysis assume the worst-case noise environment with all construction equipment operating simultaneously, at full power, at the same location on the Project site. In reality, noise levels would vary day to day and vary throughout the day, as it is highly unlikely that all pieces of construction equipment would simultaneously operate at the same time and location. The highest construction noise level increases would occur during Project grading activities. As shown on Table 6-8, *Construction Equipment Noise Level Summary*, Project-related construction noise levels during peak operating conditions are estimated to reach a maximum noise level of 80.1 A-weighted decibels (dBA) equivalent continuous (average) sound level (Leq) during grading activities when measured at 50 feet from the noise source. (Urban Crossroads, 2014d, p. 64)

As described above, noise generated during near-term Project construction activities would cause an elevated temporary increase in ambient noise levels and could potentially affect off-site receptors that might be present, particularly when construction equipment is operating in close proximity to Pats Ranch Road, east of which is a residential community. Although near-term Project construction activities on the Project site would be consistent with the City's Noise Ordinance and impacts would thus be less than significant, implementation of Mitigation Measure

Source(s): Urban Crossroads (11-21-14)

T&B PLANNING, INC.
17542 East 17th Street, Suite 100 Tustin, CA 92780
p. 714.505.6360 f. 714.505.6361
www.tbplanning.com

NOT TO SCALE

Figure 6-1

NOISE RECEIVER LOCATIONS

N-1 would ensure compliance with the City's Noise Ordinance and ensure that additional noise attenuation measures are incorporated into the Project's construction plans to minimize the exposure of nearby sensitive receptors to temporary increases in ambient noise levels such that the increases would not be considered substantial. Traffic mitigation measure TR-1, requiring City approval and contractor implementation of a construction traffic management plan, would also reduce construction-related noise impacts by prohibiting construction traffic from being routed through any residential areas.

Table 6-8 Construction Equipment Noise Level Summary

Noise Receiver[1]	Distance To Property Line (In Feet)[4]	Construction Phase Hourly Noise Level (dBA Leq)				
		Grading	Building Const.	Arch. Coating	Paving	Peak[2]
R1	1,239'	54.3	49.9	41.1	48.0	54.3
R2	913'	57.0	52.5	43.8	50.6	57.0
R3	502'	62.2	57.7	49.0	55.8	62.2
R4	416'	63.8	59.3	50.6	57.5	63.8
R5	477'	62.6	58.1	49.4	56.3	62.6
R6	232'	68.9	64.4	55.7	62.5	68.9
R7	138'	73.4	68.9	60.2	67.0	73.4
R8	1,053'	55.7	51.3	42.6	49.4	55.7
R9	374'	64.7	60.3	51.5	58.4	64.7
R10	141'	73.2	68.7	60.0	66.9	73.2
R11	113'	80.1	75.7	66.9	73.8	80.1

1 Noise receiver locations are shown on Figure 6-1.
2 Estimated construction noise levels during peak operating conditions.
Source: Urban Crossroads, 2014d, Table 10-5, Construction Equipment Noise Level Summary

Mitigation

Mitigation Measure N-1: Prior to grading and building permit issuance, the City shall verify that the following notes are included on grading plans and building plans. Project contractors shall be required to ensure compliance with the notes and permit periodic inspection of the construction site by City of Jurupa Valley staff or its designee to confirm compliance. These notes also shall be specified in bid documents issued to prospective construction contractors.

a) All construction activities shall comply with City Ordinance No. 847 (Noise Ordinance).

b) Construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards.

c) All stationary construction equipment shall be placed in such a manner so that emitted noise is directed away from the construction site's southern and eastern Project boundaries.

d) Construction equipment staging areas shall be located in areas of the property that would create the greatest distance between construction-related noise sources and noise sensitive receivers nearest the Project site's southern and eastern boundaries.

❑ **Impact Analysis for Long-Term Operational Noise**

The Noise Element included as Chapter 7 of the City's General Plan provides performance standards and noise control guidelines for determining and mitigating non-transportation (stationary) noise source impacts. The stationary noise source criteria are used to control operational noise sources such as idling trucks, outdoor speakers, and mechanical ventilation systems. As established by General Plan performance standards, these noises, as projected to any portion of any surrounding property containing a habitable dwelling, hospital, school, library or nursing home, shall not exceed 65 equivalent level dBA (dBA Leq) between 7:00 a.m. and 10:00 p.m. or 45 dBA Leq between 10:00 p.m. and 7:00 a.m. for a cumulative period of more than ten (10) minutes per hour.

While the General Plan provides background on noise fundamentals and establishes noise compatibility standards for noise-sensitive land uses, it does not include any standards or criteria to assess the impacts associated with transportation (mobile) noise source impacts. Therefore, for purposes of evaluating long-term operational transportation-related noise impacts within the City, the analysis in this IS/MND relies on the noise criteria derived from the standards provided in the *General Plan Guidelines*, a publication of the State Office of Planning and Research. These standards are used by many California cities and counties, including the City of Jurupa Valley. For noise-sensitive land uses such as residential land uses, including multi-family projects, exterior noise levels up to 65 dBA community noise level equivalent level (CNEL) and interior noise levels up to 45 dBA CNEL are considered to be compatible with transportation-related noise sources. A project is considered to result in a significant transportation-related noise impact if traffic generated by that project would cause or contribute to exterior noise levels in excess of 65 dBA CNEL and the project's contribution to the noise environment equals 3 dBA CNEL or more. (A change of 3 dBA is considered "barely perceptible" by the human ear and changes of less than 3 dBA CNEL generally cannot be perceived except in carefully controlled laboratory environments).

Off-Site Non-Transportation-Related Noise Impacts (Stationary Noise)

The Project proposes the development of an apartment community. This type of land use is not typically associated with a substantial permanent increase in ambient noise because it does not include any major stationary noise sources such as industrial machinery, loading docks, commercial air conditioning units, etc. The proposed Project does not include any of these kinds of stationary

noise sources. There would be a number of small-scale air conditioning units with air filtration systems, but these would be well shielded by the apartment buildings and would be hundreds or thousands of feet away from any off-site sensitive receptors located to the east of Pats Ranch Road. Therefore, the proposed apartment community is not anticipated to generate substantial noise levels or noise that may exceed the limits prescribed in the City's Noise Ordinance. Long-term impacts to off-site receptors associated with non-transportation-related noise would be less than significant.

Off-Site Transportation-Related Noise Impacts (Mobile Noise)

Future traffic generated by the proposed Project has the potential to cause or contribute to elevated traffic-related noise volumes at off-site locations, which could potentially impact sensitive receptors. To assess the off-site noise level increases associated with development of the proposed Project, noise contours were developed by Urban Crossroads for the following traffic scenarios:

Existing: This scenario refers to the existing traffic noise conditions, without and with the proposed Project.

Project Completion (Year 2016): This scenario refers to the background noise conditions at Project completion (Year 2016) without and with the proposed Project.

Year 2035: This scenario refers to the background noise conditions at Year 2035 without and with the proposed Project.

Traffic noise contour boundaries were established by Urban Crossroads based on future traffic conditions on off-site study area road segments. The contours represent the equal levels of noise exposure as measured from the center of each roadway and do not take into account the effect of any existing noise barriers or topography that may affect ambient noise levels. Existing and projected future noise levels, both with and without Project traffic, are presented in Table 6-9, Table 6-10, and Table 6-11.

Table 6-9, *Existing Off-Site Project-Related Noise Impacts*, presents a comparison of the existing noise conditions to the noise conditions that would result with implementation of the proposed Project in the absence of cumulative development and ambient growth. As indicated on Table 6-9, off-site roadway noise levels within the Project study area would increase up to 1.0 dBA CNEL at two roadway segments (Pats Ranch Road, north of 65th Street and Pats Ranch Road south of 65th Street) with development of the Project. As shown in Table 6-9, there are several roadway segments in the Project study area that would exceed the City of Jurupa Valley's 65 dBA CNEL exterior noise standard for residential land uses both with and without the Project. However, the Project would not directly cause any roadway segment to exceed the 65 dBA CNEL noise standard and the Project's incremental noise contributions to study area roadways would be considered "barely perceptible" (i.e., less than 3 dBA CNEL). Therefore, because the without Project noise levels are between 60 and 65 dBA and the Project would not generate a readily perceptible 3 dBA or greater Project-related noise level increase, off-site transportation-related noise impacts would be less than significant under Existing plus Project conditions. (Urban Crossroads, 2014d, p. 48)

Table 6-10, *Year 2016 Off-Site Project-Related Traffic Noise Impacts*, presents a comparison of the projected noise conditions in the Year 2016 (estimated Project completion year), including cumulative development and ambient growth, to the noise conditions that would result with implementation of the proposed Project. As shown in Table 6-10, off-site roadway noise levels within the Project study area would increase up to 1.8 dBA CNEL at one roadway segment (Limonite Avenue west of the I-15 southbound ramp) with development of the proposed Project, which could be potentially significant because the without project noise level CNEL is greater than 65 dBA and the project related increase is greater than 1.5 dBA; however, there are no noise-sensitive receptors impacted by the off-site traffic noise level impacts on this road segment. As shown in Table 6-10, there are several roadway segments in the Project study area that are projected to exceed the City of Jurupa Valley's 65 dBA CNEL standard for residential uses both with and without the Project. However, the Project would not directly cause any roadway segment to exceed the dBA CNEL standard and the Project's incremental noise contributions to study area roadways would be considered "barely perceptible" (i.e., less than 3 dBA CNEL). Therefore, under Year 2016 conditions, the Project would not result in a substantial permanent increase in surrounding roadway noise levels above ambient conditions. Thus, off-site transportation-related noise impacts would be less than significant under Year 2016 plus Project conditions.

Table 6-9 Existing Off-Site Project-Related Noise Impacts

ID	Road	Segment	CNEL at 100 Feet (dBA)			Potential Significant Impact?[1]
			No Project	With Project	Project Addition	
1	Hammer Av.	n/o 68th St.	65.2	65.3	0.1	No
2	Hammer Av.	s/o 68th St.	66.2	66.2	0.0	No
3	Pats Ranch Rd.	s/o Limonite Av.	63.2	63.7	0.5	No
4	Pats Ranch Rd.	n/o 65th St.	60.4	61.4	1.0	No
5	Pats Ranch Rd.	s/o 65th St.	60.5	61.5	1.0	No
6	Pats Ranch Rd.	n/o Ivory St.	60.5	61.2	0.7	No
7	Pats Ranch Rd.	n/o 68th St.	60.3	60.8	0.5	No
8	Limonite Av.	w/o I-15 SB Ramp	68.2	68.3	0.1	No
9	Limonite Av.	e/o I-15 SB Ramp	68.1	68.2	0.1	No
10	Limonite Av.	e/o I-15 NB Ramp	70.7	70.8	0.1	No
11	Limonite Av.	w/o Pats Ranch Road	70.1	70.3	0.2	No
12	Limonite Av.	e/o Pats Ranch Road	69.8	69.9	0.1	No
13	Limonite Av.	e/o Wineville Av.	69.4	69.5	0.1	No
14	68th St.	w/o Hammer Av.	60.3	60.3	0.0	No
15	68th St.	e/o Hammer Av.	62.5	62.7	0.2	No
16	68th St.	w/o Pats Ranch Road	63.0	63.3	0.3	No
17	68th St.	e/o Pats Ranch Road	60.6	60.7	0.1	No

[1] A significant impact is defined when noise levels exceed 65 dBA and a project contributes 3.0 dBA or more to the affected roadway.

Source: Urban Crossroads, 2014d, Table 7-7, Existing Off-Site Project Related Traffic Noise Impacts

Table 6-10 Year 2016 Off-Site Project-Related Traffic Noise Impacts

ID	Road	Segment	CNEL at 100 Feet (dBA)			Potential Significant Impact?[1]
			No Project	With Project	Project Addition	
1	Hammer Av.	n/o 68th St.	65.5	66.5	1.0	No
2	Hammer Av.	s/o 68th St.	66.4	67.2	0.8	No
3	Pats Ranch Rd.	s/o Limonite Av.	63.8	64.7	0.9	No
4	Pats Ranch Rd.	n/o 65th St.	61.5	62.5	1.0	No
5	Pats Ranch Rd.	s/o 65th St.	61.6	62.5	0.9	No
6	Pats Ranch Rd.	n/o Ivory St.	61.3	62.3	1.0	No
7	Pats Ranch Rd.	n/o 68th St.	60.9	62.0	1.1	No
8	Limonite Av.	w/o I-15 SB Ramp	68.4	70.2	1.8	Yes
9	Limonite Av.	e/o I-15 SB Ramp	68.4	69.8	1.4	No
10	Limonite Av.	e/o I-15 NB Ramp	71.0	71.9	0.9	No
11	Limonite Av.	w/o Pats Ranch Road	70.4	71.4	1.0	No
12	Limonite Av.	e/o Pats Ranch Road	70.1	71.0	0.9	No
13	Limonite Av.	e/o Wineville Av.	69.7	70.5	0.8	No
14	68th St.	w/o Hammer Av.	60.5	60.9	0.4	No
15	68th St.	e/o Hammer Av.	62.9	63.5	0.6	No
16	68th St.	w/o Pats Ranch Road	63.4	63.8	0.4	No
17	68th St.	e/o Pats Ranch Road	60.8	61.5	0.7	No

[1] A significant impact is defined when noise levels exceed 65 dBA and a project contributes 3.0 dBA or more to the affected roadway.

Source: Urban Crossroads, 2014d, Table 7-8, Year 2016 Off-Site Project Related Traffic Noise Impacts

Table 6-11, *Year 2035 Off-Site Project-Related Traffic Noise Impacts*, presents a comparison of the projected noise conditions in the Year 2035, including cumulative development and ambient growth, to the noise conditions that would result with implementation of the proposed Project. Off-site roadway noise levels within the Project study area would increase up to 0.6 dBA at one roadway segment (Pats Ranch Road, south of 65th Street) with development of the proposed Project. As shown in Table 6-11, there are several roadway segments in the Project study area that are projected to exceed the City of Jurupa Valley's 65 dBA CNEL standard for residential land uses both with-and-without the Project. However, the Project would not directly cause any roadway segment to exceed the 65 dBA CNEL standard and the Project's incremental noise contributions to study area roadways would be considered "barely perceptible" (i.e., less than 3 dBA CNEL). Accordingly, the Project would not result in a substantial permanent increase in surrounding roadway noise levels above ambient conditions under Year 2035 conditions. Therefore, off-site transportation-related noise impacts would be less than significant under Year 2035 plus Project conditions.

Table 6-11 Year 2035 Off-Site Project-Related Traffic Noise Impacts

ID	Road	Segment	CNEL at 100 Feet (dBA)			Potential Significant Impact?[1]
			With Project	Project Plus Cumulative	Project Addition	
1	Hammer Av.	n/o 68th St.	67.0	67.0	0.0	No
2	Hammer Av.	s/o 68th St.	67.7	67.7	0.0	No
3	Pats Ranch Rd.	s/o Limonite Av.	66.1	66.3	0.2	No
4	Pats Ranch Rd.	n/o 65th St.	63.3	63.8	0.5	No
5	Pats Ranch Rd.	s/o 65th St.	63.4	64.0	0.6	No
6	Pats Ranch Rd.	n/o Ivory St.	63.4	63.8	0.4	No
7	Pats Ranch Rd.	n/o 68th St.	63.2	63.5	0.3	No
8	Limonite Av.	w/o I-15 SB Ramp	71.0	71.0	0.0	No
9	Limonite Av.	e/o I-15 SB Ramp	70.5	70.6	0.1	No
10	Limonite Av.	e/o I-15 NB Ramp	72.9	73.0	0.1	No
11	Limonite Av.	w/o Pats Ranch Road	72.9	73.0	0.1	No
12	Limonite Av.	e/o Pats Ranch Road	72.9	72.9	0.0	No
13	Limonite Av.	e/o Wineville Av.	72.0	72.0	0.0	No
14	68th St.	w/o Hammer Av.	61.3	61.3	0.0	No
15	68th St.	e/o Hammer Av.	63.8	64.0	0.2	No
16	68th St.	w/o Pats Ranch Road	66.0	66.1	0.1	No
17	68th St.	e/o Pats Ranch Road	63.5	63.5	0.0	No

[1] A significant impact is defined when noise levels exceed 65 dBA and a project contributes 3 dBA or more to the affected roadway. *(Source: Federal Interagency Committee on Noise (FICON), 2002)*
Source*: Urban Crossroads, 2014d, Table 7-9, Year 2035 Off-Site Project Related Traffic Noise Impacts*

In summary, long-term operation of the proposed Project would not generate a substantial permanent increase in transportation-related ambient noise levels, nor would Project-related traffic expose persons to permanent or noise levels in excess of the standards established by the City of Jurupa Valley. Thus, impacts associated with off-site transportation-related noise would be less than significant and no mitigation would be required.

On-Site Non-Transportation-Related Noise Impacts (Stationary Source)

The Project site is surrounded by vacant land to the immediate north that is zoned Industrial Park (I-P) and Heavy Agriculture (A-2-10), residential development to the east, park site to the northeast, vacant land zoned for residential land uses to the south, and residential land uses to the west of I-15. None of these land uses are considered to be a source of substantial non-transportation-related stationary noise, in their current conditions. Accordingly, implementation of the Project would not expose future on-site residents to non-transportation-related stationary noise levels from existing neighboring land uses in excess of those allowed by the City's Noise Ordinance.

The type of development that may occur on the land zoned for Industrial Park uses immediately to the north cannot be defined at this time, since there is no development proposal under consideration. It would be speculative to assume and evaluate any particular kind of land use that might occur with respect to potential noise impacts that could affect the Project site. The Project Applicant, who also owns that adjacent I-P zoned property, has indicated it will record covenants on the land title to prohibit future industrial uses on that site. Nevertheless, there is some potential that a future land use might have truck loading docks, large air conditioning units, outdoor activity areas, etc. that could generate noise that would be audible within the Project site. Any such future land use would be subject to compliance with the City's Noise Ordinance regulations and other regulations to prohibit generation of excessive noise at adjoining properties, and the development plan would be subject to the City's discretionary approval authority to assure compliance with zoning standards, compatibility with the Project, and to examine potential noise impacts through an assessment of the environmental impacts, pursuant to CEQA. Compliance with the City's existing planning procedures is expected to ensure that some future industrial use, if proposed on the adjacent property, would be designed to prevent significant noise impacts to the Project site. Thus, long-term on-site noise impacts associated with non-transportation-related noise would be less than significant.

On-Site Transportation-Related Noise Impacts (Mobile Source)

It is expected that the primary source of transportation-related noise affecting the Project site would be traffic noise from I-15, located to the west of the site, and 68th Street located to the south of the site. To determine if the future residents on the Project site could be exposed to substantial transportation-related noise from I-15 and/or 68th Street, estimated noise levels under Year 2035 conditions were calculated by Urban Crossroads. Table 6-12, *Exterior Noise Levels,* presents a summary of future noise levels at the proposed first floor patio areas.

For a description of the receiver locations identified in Table 6-12 above, please refer to Figure 6-2. Calculations indicate that the buildings facing I-15 and 68th Street would experience unmitigated exterior noise levels ranging from 47.2 to 75.9 dBA CNEL. Refer to *Technical Appendix I* for the on-site traffic noise analysis calculations. Thus, the Project has the potential to expose on-site residents to exterior noise levels in excess of 65 dBA CNEL, which is regarded as a significant impact for which mitigation is required. Implementation of Mitigation Measure N-2 would require the Project to construct a 12 foot high noise barrier at the locations of Noise Receivers R3 to R6 and R9 to R10 for proposed buildings 1 and 21-25 adjacent to I-15. With implementation of the recommended noise barriers, the Project's ground level outdoor living areas would be exposed to exterior noise below the significance threshold of 65 dBA.

To determine if the interior noise levels comply with the City of Jurupa 45 dBA CNEL interior noise standards, future noise levels were calculated at the proposed first, second, and third floor building facades. Table 6-13, *First Floor Interior Noise Levels (CNEL)*, indicates that future noise levels at the proposed first floor building façades are expected to range from 47.2 to 64.2 dBA CNEL and standard windows with a minimum Sound Transmission Class (STC) rating of 27 are expected to satisfy the City of Jurupa Valley's 45 dBA CNEL interior noise level standards. Table 6-14, *Second Floor Interior Noise Levels (CNEL)*, indicates that future noise levels at the proposed second floor

Table 6-12 Exterior Noise Levels

TNM Receiver Location[1]	Peak Hour Noise Levels (dBA Leq)[2]		CNEL Conversion Factor[3]	24-Hour Noise Levels (dBA CNEL)[4]		Top of Noise Barrier Elevation
	Without Sound Wall	With 12' Sound Wall		Without Sound Wall	With 12' Sound Wall	
R1	53.9	–[5]	+2.0	55.9	–[5]	635.0'
R2	45.2	–[5]	+2.0	47.2	–[5]	639.0'
R3	59.8	55.5	+2.0	61.8	57.5	637.5'
R4	52.0	51.5	+2.0	54.0	53.5	636.1'
R5	65.5	58.8	+2.0	67.5	60.8	635.2'
R6	54.8	54.4	+2.0	56.8	56.4	635.2'
R7	61.9	–[5]	+2.0	63.9	–[5]	642.0'
R8	62.2	–[5]	+2.0	64.2	–[5]	639.0'
R9	73.5	61.6	+2.0	75.5	63.6	637.5'
R10	73.9	61.9	+2.0	75.9	63.9	637.5'

1 See Exhibit 6-A of the Noise Impact Analysis (*Technical Appendix H*) for the TNM receiver locations.
2 Peak hour noise level calculations included in Appendix 8.1.
3 Peak hour to CNEL conversion factor as shown in Table 6-8.
4 Noise barrier recommendations are included on Exhibit ES-A.
5 Receivers that require the planned earthen berm without a recommended sound wall.
Source: Urban Crossroads, 2014d, Table 8-1, Exterior Noise Levels

building façades are expected to range from 48.6 to 68.9 dBA CNEL and windows with an upgraded STC rating of 33 are expected to satisfy the City of Jurupa Valley's 45 dBA CNEL interior noise levels. As indicted in Table 6-15, *Third Floor Interior Noise Levels (CNEL)* future noise levels at the proposed third floor building façades would range from 54.9 to 72.2 and windows with an upgraded STC rating of 33 are expected to satisfy the City of Jurupa Valley's 45 dBA CNEL interior noise level standards.

Implementation of Mitigation Measure N-2 would require the Project to provide special building measures to ensure that future residents of the proposed apartment community are not exposed to interior noise levels that exceed the City of Jurupa Valley's standard 45 dBA CNEL. As shown previously on Table 6-12, with the recommended noise barriers, the mitigated future exterior noise levels would satisfy the City of Jurupa Valley 65 dBA CNEL exterior noise level standards. Thus, with the incorporation of the required mitigation, significant impacts associated with the exposure of on-site noise receptors to transportation noise would be reduced to less than significant. In addition, implementation of Mitigation Measure N-3 would require preparation of an interior noise study that would finalize the noise attenuation requirements using the precise grading plans and actual design specifications.

Table 6-13 First Floor Interior Noise Levels (CNEL)

TNM Receiver Location	Noise Level at Façade[1]	Required Interior Noise Reduction[2]	Estimated Interior Noise Reduction[3]	Upgraded Windows[4]	Interior Noise Level[5]
R1	55.9	10.9	25	No	30.9
R2	47.2	2.2	25	No	22.2
R3	–[6]	–[6]	–[6]	–[6]	–[6]
R4	53.5	8.5	25	No	28.5
R5	60.8	15.8	25	No	35.8
R6	56.4	11.4	25	No	31.4
R7	63.9	18.9	25	No	38.9
R8	64.2	19.2	25	No	39.2
R9	–[6]	–[6]	–[6]	–[6]	–[6]
R10	–[6]	–[6]	–[6]	–[6]	–[6]

1 Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning).
2 Noise reduction required to satisfy the 45 dBA CNEL interior noise standards.
3 A minimum of 25 dBA noise reduction is assumed with standard building construction.
4 Does the required interior noise reduction trigger upgraded windows with a minimum STC rating of greater than 27?
5 Estimated interior noise level with minimum STC rating for all windows.
6 Receiver represents an outdoor area and does not have a first floor requiring interior noise level reduction.
Source: Urban Crossroads, 2014d, Table 8-2, First Floor Interior Noise Impacts (CNEL)

Table 6-14 Second Floor Interior Noise Levels (CNEL)

TNM Receiver Location	Noise Level at Façade[1]	Required Interior Noise Reduction[2]	Estimated Interior Noise Reduction[3]	Upgraded Windows[4]	Interior Noise Level[5]
R1	67.1	22.1	25	No	42.1
R2	48.6	3.6	25	No	23.6
R3	–[6]	–[6]	–[6]	–[6]	–[6]
R4	55.6	10.6	25	No	30.6
R5	66.4	21.4	25	No	41.4
R6	60.2	15.2	25	No	35.2
R7	67.8	22.8	25	No	42.8
R8	68.9	23.9	25	No	43.9
R9	–[6]	–[6]	–[6]	–[6]	–[6]
R10	–[6]	–[6]	–[6]	–[6]	–[6]

1 Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning).
2 Noise reduction required to satisfy the 45 dBA CNEL interior noise standards.
3 Estimated noise reduction with the recommended windows.
4 Does the required interior noise reduction trigger upgraded windows with a minimum STC rating of greater than 27?
5 Estimated interior noise level with minimum STC rating for all windows.
6 Receiver represents an outdoor area and does not have a second floor requiring interior noise level reduction.
Source: Urban Crossroads, 2014d, Table 8-3, Second Floor Interior Noise Impacts (CNEL)

Table 6-15 Third Floor Interior Noise Levels (CNEL)

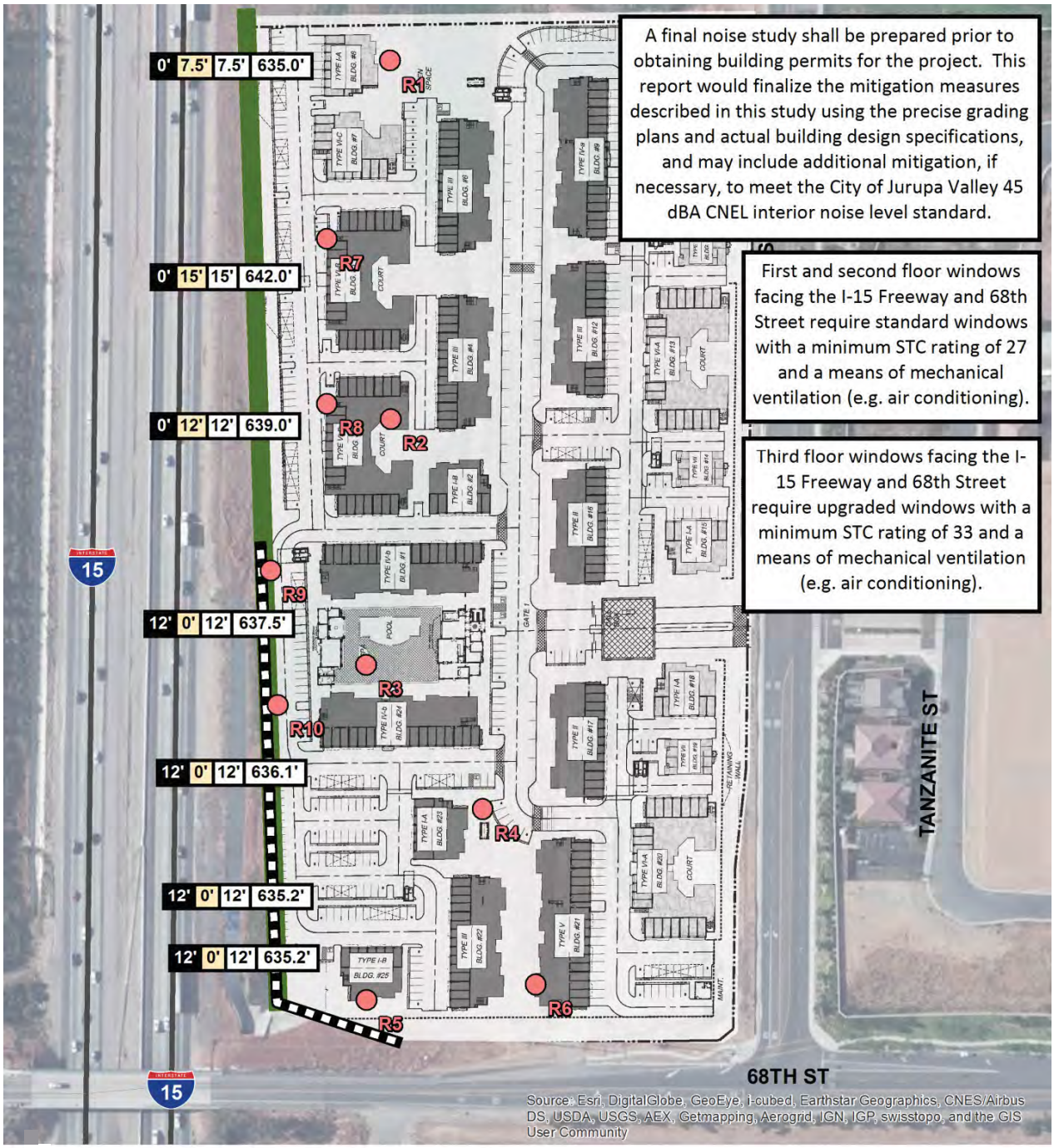
TNM Receiver Location	Noise Level at Façade[1]	Required Interior Noise Reduction[2]	Estimated Interior Noise Reduction[3]	Upgraded Windows[4]	Interior Noise Level[5]
R1	n/a	n/a	n/a	n/a	n/a
R2	54.9	9.9	25	No	29.9
R3	–[6]	–[6]	–[6]	–[6]	–[6]
R4	59.6	14.6	25	No	34.6
R5	71.8	26.8	31	Yes	40.8
R6	64.5	19.5	25	No	39.5
R7	71.5	26.5	31	Yes	40.5
R8	72.2	27.2	31	Yes	41.2
R9	–[6]	–[6]	–[6]	–[6]	–[6]
R10	–[6]	–[6]	–[6]	–[6]	–[6]

1 Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning).
2 Noise reduction required to satisfy the 45 dBA CNEL interior noise standards.
3 Estimated noise reduction with the recommended windows.
4 Does the required interior noise reduction trigger upgraded windows with a minimum STC rating of greater than 27?
5 Estimated interior noise level with minimum STC rating for all windows.
6 Receiver represents an outdoor area and does not have a third floor requiring interior noise level reduction.
"n/a" = Receiver represents a two-story building as indicated on the site plan prepared by Architects Orange, October 7, 2014.
Source: Urban Crossroads, 2014d, Table 8-4, Third Floor Interior Noise Impacts (CNEL)

Mitigation

Mitigation Measure N-2: Prior to issuance of any building permits for buildings adjacent to I-15 (Building 1 and Buildings 21 to 25), a minimum effective 12 foot high barrier shall be constructed on the western boundary of the Project site adjacent to I-15. Recommended barrier locations and other noise mitigation measures are shown on Figure 6-2, *Noise Mitigation*.

Mitigation N-3: Prior to issuance of building permits, a final noise study based on final precise grading plan elevations shall be prepared by a qualified acoustician and approved by the City to validate appropriate noise barrier heights, locations, and construction materials. All required noise barriers shall be designed to reduce noise levels to below 65 dBA CNEL within outdoor living areas. The noise barrier shall provide a weight of at least 4 pounds per square foot of face area with no decorative cutouts or line-of-sight openings between shielded areas and the roadways. The noise barriers may consist of masonry



LEGEND:

12'	Recommended sound wall height (in feet)		Recommended sound wall location
15'	Planned berm height (in feet)		Planned Berm Location
15'	Effective barrier height (in feet)	●	TNM Model Noise Receiver Locations
642.0'	Top of noise barrier elevation (in feet)		

Source(s): Urban Crossroads (11-21-14)

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NOT TO SCALE

Figure 6-2

NOISE MITIGATION

block, stucco veneer over wood framing (or foam core), or 1 inch thick tongue and groove wood of sufficient weight per square foot, ¼ inch thick glass or other transparent material with sufficient weight per square foot, earthen berm, or any combination of these materials that achieves the required noise attenuation and shall have no decorative cutouts or other line-of-sight openings between shielded areas and the noise source (adjacent roadway). Prior to issuance of building permits, the City of Jurupa Valley shall review and approve the noise barrier design, placement, and materials to ensure that the required level of sound attenuation will be achieved.

Mitigation Measure N-4: Prior to issuance of any residential building permits, an interior noise analysis shall be completed to the satisfaction of the City Planning Department demonstrating that the proposed building materials will achieve interior noise levels less than 45 dBA CNEL. Building materials that would facilitate compliance with the 45 dBA CNEL interior noise standard, include, but are not limited to dual-glazed windows and a means of "windows closed" mechanical ventilation (e.g. air conditioning).

6.12(b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Finding: Less-than-Significant Impact

(Sources: Noise Impact Analysis, 2014d; Ordinance No. 847)

The City of Jurupa Valley has not adopted vibration standards other than for passing trains. The Project site is not exposed to vibration from passing trains. However, the United States Department of Transportation (FTA) provides guidelines for maximum-acceptable vibration criteria for different types of land uses. These guidelines allow 80 Vibration decibels (Vdb) for residential uses and buildings where people normally sleep. Construction activity can result in varying degrees of ground-borne vibration, depending on the equipment and methods used and the distance to the affected structures and soil type. Construction vibration is generally associated with pile driving or rock blasting. The Project does not propose to employ any pile driving, rock blasting, or rock crushing equipment during construction activities. Other construction equipment such as air compressors, light trucks, hydraulic loaders, etc., generate little or no known vibration. Occasionally, large bulldozers and loader trucks can cause perceptible vibration levels at close proximity. While not enforceable regulations within the City of Jurupa Valley, the FTA guidelines of 80 Vdb for sensitive land uses provide the basis for determining the relative significance of potential Project-related vibration impacts.

Under existing conditions, there are no known sources of ground-borne vibration or noise that affect the Project site. The Project would not generate ground-borne vibration or ground-borne noise, except, potentially during the construction phase from the use of heavy construction equipment. It is expected that ground-borne vibration from Project construction activities would only cause intermittent, localized intrusion ground-borne vibration levels resulting from construction activities occurring within the Project site. Construction activities that would occur within the Project site are expected to include grading, which would have the potential to generate low levels of ground-borne vibration. Based on the FTA standards, none of the vibration levels

from construction equipment are projected to reach or exceed 80 Vdb. As such, impacts from ground-borne vibration and noise during near-term construction would be less than significant.

There are no conditions associated with the long-term operation of the proposed Project that would result in the exposure of on- or off-site residents to excessive ground-borne vibration or noise. The proposed Project would develop the subject property as a multi-family residential community and would not include nor require equipment, facilities, or activities that would generate ground-borne vibration or ground-borne noise. In addition, the Project site is not located in the vicinity of a railroad line or any other use associated with ground-borne vibration or ground-borne noise; therefore, the Project would not expose future on-site residents to substantial ground-borne vibration or noise. Accordingly, under long-term operation, the Project would not expose on- or off-site sensitive receptors to substantial ground-borne vibration or ground-borne noise. Impacts are less than significant.

6.12(c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Finding: Less-than-Significant Impact

(Sources: Noise Impact Analysis, 2014d; Ordinance No. 847)

As discussed above under Issue 6.12(a), the only potential for the Project to create a substantial permanent increase in ambient noise levels is the result of future traffic generated by the proposed Project that has the potential to cause or contribute to elevated traffic-related noise volumes at off-site locations. The analysis presented under Issue 6.12(a) concluded that the Project's incremental noise contributions to study area roadways would be considered "barely perceptible" (i.e., less than 3.0 dBA CNEL). As such, the Project's traffic would not result in a substantial permanent increase in ambient roadway noise levels. Off-site transportation-related noise impacts would be less than significant and mitigation is not required.

Mitigation

No mitigation is required.

6.12(d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Finding: Less-than-Significant Impact with Mitigation Incorporated

(Sources: Noise Impact Analysis, 2014d; Ordinance No. 847)

As discussed above under Issue 6.12(a), the only potential for the Project to create a substantial temporary or periodic increase in ambient noise levels is during its construction phase. The analysis presented under Issue 6.12(a) concluded that the Project would result in elevated noise levels during construction and although the impact would be less than significant via mandatory compliance with the City's Noise Ordinance, Mitigation Measure N-1 is included to reduce exposure of off-site receptors to construction-related noise.

Mitigation

Mitigation Measure N-1 shall apply.

6.12(e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Finding: No Impact

(Sources: City of Jurupa Valley General Plan, Figure 5, Chino Airport Influence Policy Area)

The nearest airport to the Project site is the Chino Airport, located more than 5.0 miles west of the Project site. As shown on General Plan Eastvale Area Plan Figure 5, Chino Airport Influence Policy Area, the project site is not located within the Chino Airport Influence Policy Area. The Project site is not located within in the influence area of any airport land use plan, nor is the Project site located within two (2) miles of any public airport or public use airport. Accordingly, the Project has no potential to expose future residents in the Project area to excessive, airport-related noise. No impact would occur.

Mitigation

No mitigation is required.

6.12(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?

Finding: No Impact

(Sources: City of Jurupa Valley General Plan, Figure 5, Chino Airport Influence Policy Area)

There are no private airfields or airstrips in the vicinity of the Project site. Accordingly, the Project would have no potential to expose future residents in the Project area to excessive noise levels associated with a private airstrip. No impact would occur.

Mitigation

No mitigation is required.

6.13 POPULATION AND HOUSING

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, 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?				✓

Impact Analysis

6.13(a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

Finding: Less-than-Significant Impact

(Sources: Project Application Materials; Google Earth; State of California, Department of Finance, "E-5 Population and Housing Estimates for Cities, Counties and the State — January 1, 2011- 2014; City of Jurupa Valley General Plan Appendix E)

The Project site is designated by the Jurupa Valley General Plan for "Community Development: Light Industrial (LI)" land uses. General Plan Amendment No. 1404 (GPA1404) proposes to change the Project site's General Plan land use designation from Community Development: Light Industrial (LI) to Community Development: Highest Density Residential (HHDR), which would allow for the development of multi-family residential land uses at a density range of 20+ dwelling units per acre.

The proposed Project would develop the subject property with up to 397 apartment units. Therefore, using population estimates provided by the California Department of Finance, the proposed Project would increase the City of Jurupa Valley's population by up to approximately 1,540 (397 x 3.88 = 1,540.36) new residents.

Under CEQA, direct population growth by a project is not considered necessarily detrimental, beneficial, or of little significance to the environment. Typically, population growth would be considered a significant impact pursuant to CEQA if it directly or indirectly affects the ability of agencies to provide needed public services and requires the expansion or new construction of public facilities and utilities, or if it can be demonstrated that the potential growth results in a

physical adverse environmental effect. Impacts associated with the proposed Project's future population are evaluated throughout this IS/MND, and where impacts are identified mitigation measures have been imposed on the Project to reduce such impacts to a level below significant. There is no indication, based on the analysis throughout this IS/MND that this Project would result in significant adverse environmental impacts associated with responding to the population growth induced by this Project. Accordingly, the Project's direct impacts associated with population inducement would be less than significant.

Additionally, it is unlikely that the Project would indirectly induce population growth on nearby properties because the Project would not remove any impediments to growth in the area. The Project site is surrounded by development and properties approved for development, including I-15 immediately west of the Project site; thus, the development potential of surrounding properties is limited. Although the Project may result in the construction of approximately 500 linear feet of offsite water lines across I-15, the construction of such a water line only would serve the proposed Project and the recently-approved "Riverbend" project to the south. The construction of this off-site water line would not induce or encourage the development of any other properties in the surrounding area.

Based on the foregoing analysis, and assuming compliance with the mitigation measures identified throughout this IS/MND, the Project's direct and indirect impacts due to population growth would be less than significant.

Mitigation

No mitigation is required.

6.13(b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

Finding: No Impact.

(Sources: Project Application Materials; Google Earth)

Under existing conditions, the Project site is vacant and undeveloped and does not contain any housing. Accordingly, the Project would not displace existing housing, nor would it necessitate the construction of replacement housing elsewhere. No impact would occur.

Mitigation

No Mitigation is required.

6.13(c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

Finding: No Impact

(Sources: Project Application Materials; Google Earth)

As described under the response to Issue 6.13(b) above, under existing conditions, the Project site is vacant and undeveloped and does not contain any housing. Accordingly, the Project would not displace people, necessitating the construction of replacement housing elsewhere. No impact would occur.

Mitigation

No mitigation is required.

6.14 PUBLIC SERVICES

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. 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 public services:				
1) Fire protection?			✓	
2) Police protection?			✓	
3) Schools?			✓	
4) Parks?			✓	
5) Other public facilities?			✓	

Impact Analysis

6.14(a) 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 public services:

1. Fire Protection

Finding: Less-than-Significant Impact

(Sources: Riverside County Fire Protection Master Plan-1987; Riverside County Fire Department Strategic Master Plan 2009-2029; Riverside County Fire Department "Fire Stations"; Google Earth; Ordinance No. 659, Project Application Materials; Captain Andre Schmidt, Captain, Eastvale Fire Station)

The Riverside County Fire Department provides fire protection services to the Project area. Development of the proposed Project would affect fire protection services by placing an additional demand on existing Riverside County Fire Department resources, which could be required to respond to emergency medical situations, structural fires, and possibly some sort of hazardous materials incident over the operating life of the Project.

The Riverside County Fire Department provides fire protection services to the Project area. The Project would be primarily served by the West Riverside Fire Station (Station No. 18), an existing station located approximately 1.8 roadway miles east of the Project site at 7545 Mission Boulevard.

Development of the proposed Project would impact fire protection services by placing an additional demand on existing Riverside County Fire Department resources should its resources not be augmented. To offset the increased demand for fire protection services, the proposed Project would be conditioned by the City to provide a minimum of fire safety and support fire suppression activities, including compliance with State and local fire codes, fire sprinklers, a fire hydrant system, paved access, and secondary access routes.

Furthermore, the Project would be required to comply with the provisions of the City's Development Impact Fee Ordinance, which requires a fee payment to assist the City in providing for fire protection services. Payment of the Development Impact Fee would ensure that the Project provides fair share funds for the provision of additional public services, including fire protection services, which may be applied to fire facilities and/or equipment, to offset the incremental increase in the demand for fire protection services that would be created by the Project.

Mitigation

Although the Project would not require construction of new or physically altered fire station facilities and impacts to Fire Protection services would be less than significant, Mitigation Measure PS-1 is recommended to ensure compliance with City's Development Impact Fee (DIF) Ordinance

> **Mitigation Measure PS-1:** The Project shall comply with City's Development Impact Fee (DIF) Ordinance, which requires payment of a development mitigation fee to assist in providing revenue that the City can use to improve public facilities and/or equipment, to offset the incremental increase in the demand for public services that would be created by the Project. Prior to the issuance of building permits, the Project Applicant shall pay fees in accordance with the City's Ordinance 659.

2. Police Protection

Finding: Less-than-Significant Impact

(Sources: Ordinance No. 659; Riverside County General Plan Program EIR, 2003, Chapter 4.15 – Public Services; Project Application Materials)

The Riverside County Sheriff's Department provides community policing to the Project area via the Jurupa Valley Station located at 7477 Mission Boulevard, Jurupa Valley, CA 92509. The Riverside County Sheriff's Department has set a minimum level of service standard of 1.0 deputy per 1,000 people.

At full buildout, the Project would introduce approximately 1,540 new residents to the Project site. The proposed Project would result in an increase in the cumulative demand for services from the Riverside Sheriff's Department. To maintain the desirable level of service, buildout of the proposed Project would generate a need for approximately 1.5 additional deputies. The proposed Project would not, however, result in the need for new or expanded physical sheriff facilities because the addition of approximately 1.5 deputies would not necessitate the construction of new or modified sheriff facilities.

The proposed Project's demand on sheriff protection services would not be significant on a direct basis because the Project would not create the need to construct a new Sheriff station or physically alter an existing station. The Project would be required to comply with the provisions of the City's Development Impact Fee (DIF) Ordinance (County Ordinance No. 659), which requires a fee payment which the City will use to for various public facilities, including facilities to support police protection services. Payment of the DIF fee would ensure that the Project provides fair share funds which the City can use to improve Sheriff's Department facilities and/or equipment, to offset the cost of the incremental increase in the demand for services that would be created by the Project. Thus, the Project's incremental demand for sheriff protection services would be offset with the Project's required payment of DIF fees.

Mitigation

Although the Project would not require construction of new or physically altered Sheriff's station facilities and impacts to Police Protection services would be less than significant, Mitigation Measure PS-1 shall apply to ensure compliance with City's Development Impact Fee (DIF) Ordinance

3. Schools

Finding: Less-than-Significant Impact

(Sources: California Senate Bill 50; Project Application Materials)

The proposed Project would be served by the Corona-Norco Unified School District (CNUSD). Future students generated by the Project most likely would attend the VanderMolen Elementary School located 0.1 mile east of the Project site; River Heights Intermediate School, located 1.1 miles southwest of the Project site; and the Roosevelt High School, located approximately 1.2 miles southwest of the Project site.

The construction of 397 multi-family dwelling units as proposed by the Project would increase the population in the local area and would consequently place greater demand on the existing public school system by generating additional students to be served by the CNUSD.

Although it is possible that the CNUSD may ultimately need to construct new school facilities in the region to serve the growing population within their service boundaries, such facility planning is conducted by CNUSD and is not the responsibility of the Project. Furthermore, the proposed Project would be required to contribute fees to the CNUSD in accordance with the Leroy F. Greene School Facilities Act of 1998 (Senate Bill 50). Pursuant to Senate Bill 50, payment of school impact fees constitutes complete mitigation for project-related impacts to school services, where projects are subject to compliance with CEQA. Therefore, mandatory payment of school impact fees would reduce the Project's impacts to school facilities to a level below significant, and no mitigation would be required.

Mitigation

Although the proposed Project would not directly result in impacts associated with construction of new or physically altered schools and the impact of this Project would be less than significant,

Mitigation Measure PS-2 is recommended to ensure compliance with the Leroy F. Greene School Facilities Act of 1998 (Senate Bill 50).

> **Mitigation Measure PS-2:** The Project shall comply with the Leroy F. Greene School Facilities Act of 1998 (Senate Bill 50), which requires payment of a school impact fee on a per dwelling unit basis to assist in providing revenue that school districts (including CNUSD) can use to ensure the adequate provision of public education facilities and services to service new development. Prior to the issuance of building permits, the Project Applicant shall pay required impact fees to the CNUSD following CNUSD protocol for impact fee collection.

4. Parks

Finding: Less-than-Significant Impact

(Sources: Project Application Materials; State of California, Department of Finance, "E-5 Population and Housing Estimates for Cities, Counties and the State – January 1, 2011-2014.")

As discussed below under the Responses to Issues 6.15 (a) and (b), using population estimates provided by the California Department of Finance , the proposed Project would increase the City of Jurupa Valley's population by up to approximately 1,540 (397 x 3.88 person per household = 1,540.36) new residents. Based on the Jurupa Area Recreation and Park's District (JARPD) goal of providing 5.0 acres of park land for each 1,000 residents, the Project would generate a demand for approximately 7. 7 acres of park land to meet the outdoor recreational needs of future Project residents. Some or all of that demand can be met with existing local and regional parks maintained by JARPD; however, the Project's added population would decrease the JARPD's ratio of parkland per 1,000 residents. The proposed Project would construct a swimming pool and clubhouse with fitness area, along with passive recreation areas, walkways, and a dog park to provide on-site outdoor recreation opportunities. While the Project residents would enjoy these amenities on a regular basis, and this usage could replace some demand on public recreational facilities, these private recreational facilities do not meet public parkland demand requirements.

Expansion of JARPD parks occurs from time-to-time, based on updated assessments of parkland needs and population growth, and based on available funding and priorities for expenditures of parkland funds. Pursuant to JARPD Ordinance No. 02-2007, the proposed Project would be required to pay a developer impact fee to JARPD to mitigate the project's impact involving demand for additional parkland and to help fund acquisition and development of parkland in the future. As the precise nature of parkland improvements that would be constructed, in part, using the Project's fee contribution cannot be determined at this time, it would be speculative to attempt to analyze impacts to the environment that may result from such future park construction. Prior to construction of any future park improvements, the JARPD would need to plan and design such park improvements and conduct appropriate analysis under CEQA, prior to approving a decision to acquire or develop additional parkland. The Project would also be required to pay the City's DIF, pursuant to County Ordinance 659, which allocates a portion of the fee toward acquisition of regional open space and recreation resources needed to respond to population growth due to new development. Payment of that fee, in addition to the JARPD fee required under Ordinance No. 02-

2007, would further mitigate the project's impact involving costs to provide public parkland to a growing population.

Based on the foregoing analysis, it is concluded that the proposed Project would result in a less than significant impact on the supply of public parkland. Nonetheless, mitigation is proposed to ensure that the Project contributes its fair-share towards the cost of acquiring and/or constructing new park facilities to offset the incremental effects of the proposed Project.

Mitigation

Although the Project would not require construction of new or physically altered public recreation facilities and impacts to public parks would be less than significant, Mitigation Measure PS-1 shall apply to ensure compliance with City's Development Impact Fee (DIF) Ordinance, along with Mitigation Measure PS-3, to ensure compliance with the JARPD's Development Impact Fee Ordinance No. 02-2007.

> **Mitigation Measure PS-3:** The Project shall comply with JARPD Ordinance No. 02-2007, which requires payment of a development impact fee on a per dwelling unit basis to assist in providing revenue that JARPD can use to ensure the adequate provision of public parkland to service new development. Prior to the issuance of building permits, the Project Applicant shall pay required impact fees to the JARPD, following JARPD protocol for impact fee collection.

5. Other Public Facilities

Finding: Less-than-Significant Impact

(Sources: Ordinance No. 659; Project Application Materials; California Department of Finance Table E-5 Population and Housing Estimates for Cities, Counties and the State – January 1, 2011-2014.")

Implementation of the Project would result in an increase in the population by approximately 1,540 new residents in the Project area and would increase the demand for public services, including public health services and library services. These services are provided on a regional basis and expansions to facilities occur from time to time based on the planning and funding programs of the affected agencies. Construction of a new library or health care facility, or expansions to existing facilities would not be required due to development of the proposed Project; thus the Project impact would be less than significant. The Project would be required to comply with the provisions of the City's DIF Ordinance (Ord 659), which requires a fee payment to assist the City in providing public services. Payment of the DIF fee would ensure that the Project provides fair share funds for the provision of additional public services, and these funds may be applied to the acquisition and/or construction of public services and/or equipment (including library books).

Mitigation

Although the Project would not result in direct impacts associated with the construction of new or physically altered library facilities and the impact would be less than significant, the Project Applicant shall pay DIF fees as required by MM-PS-1.

6.15 RECREATION

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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?			✓	

Impact Analysis

6.15(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?

Finding: Less-than-Significant Impact

(Sources: Project Application Materials; State of California, Department of Finance, "E-5 Population and Housing Estimates for Cities, Counties and the State – January 1, 2011-2014")

As discussed in the response to 6.14(a) Parks, the Project's estimated 1,540 residents would generate a demand for approximately 7.7 acres of park land. These residents would likely visit existing local and regional parks from time-to-time, in addition to enjoying the on-site swimming pool, clubhouse and fitness area, dog park and other outdoor walking areas to be built within the proposed apartment complex. The nearest local park is the Limonite Meadows Park, located less than ¼ mile to the east on the opposite side of Pats Ranch Road. That park is owned/maintained by the Jurupa Area Recreation and Parks District (JARPD) has grassy areas, playground equipment and picnic tables. There are several other parks maintained by the JARPD within a mile or two of the Project site, on the east side of I-15. In addition, the proposed Riverbend project, when constructed, will include public parkland.

It is considered highly unlikely that all of the Project's residents or large groups of residents would frequent Limonite Meadows Park or any other park at the same time, or that the activities they would create at any affected park would be so intensive that substantial physical deterioration would occur or be accelerated. Regional parks are intended to serve residents from a wide area and to handle outdoor recreation needs of existing and growing populations. Future residents of the proposed Project would not impact any regional parks with exceptionally intensive activities or frequency of use that would result in substantial physical deterioration of those recreation

resources. As such, the Project impacts on existing local or regional parks would be less than significant.

Mitigation

None required.

6.15(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?

Finding: Less-than-Significant Impact

(Sources: Project Application Materials)

Private, on-site recreation amenities proposed by the Project include a pool, clubhouse, picnic areas, outdoor barbeque area, dog park, and walkways. No off-site parks or recreational improvements are proposed or required as part of the Project.

Development of proposed recreational features within the Project site would have a physical impact on the environment. However, impacts resulting from their construction are described throughout the analysis in this IS/MND. In instances where significant impacts have been identified, mitigation measures are recommended in each applicable subsection of this IS/MND to reduce the impact to less-than-significant levels. Therefore, the construction of recreation facilities on-site would not result in any significant physical effects on the environment that are not already identified and disclosed as part of this Initial Study. Accordingly, additional mitigation measures beyond those identified throughout this IS/MND would not be required.

Mitigation

None required.

6.16 TRANSPORTATION/TRAFFIC

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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?			✓	

Impact Analysis

6.16(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?

Finding: Less-than-Significant Impact with Mitigation Incorporated

(Sources: Traffic Impact Analysis - Urban Crossroads 2014e)

Refer to the response under Issue 6.16(f), below, for an analysis of the Project's potential impacts to pedestrian and bicycle circulation and public transit.

For purposes of analyzing the Project's potential impacts to traffic, the City of Jurupa Valley identified the traffic impact study area in conformance with the requirements of the Riverside County's Traffic Impact Analysis (TIA) preparation guidelines, which were adopted by the City. Based on these guidelines, the minimum area to be studied includes any intersection of "Collector" or higher classification street, with "Collector" or higher classification streets, at which a proposed project would add 50 or more peak hour trips. For the proposed Project, the traffic study impact area includes nine intersections. Refer to *Technical Appendix I* for more information about the analysis methodologies employed in the Project-specific TIA prepared by Urban Crossroads.

For purposes of determining the significance of traffic impacts under this Subsection and in accordance with the City's TIA preparation guidelines:

- During the weekday AM (between 7:00 a.m. and 9:00 a.m.) and/or PM (between 4:00 p.m. and 6:00 p.m.) peak hour, if an intersection is projected to operate at an acceptable level of service (i.e., LOS "D" or better) without the Project and the addition of Project traffic (as measured by 50 or more peak hour trips) is expected to cause the intersection to operate at an unacceptable level of service (i.e., LOS "E" or "F"), the impact is considered a significant direct impact.
- When an intersection is projected to operate below an acceptable LOS (i.e., LOS "E" or "F") without the Project, and the Project is anticipated to contribute traffic (as measured by 50 or more peak hour trips), the Project's contribution to the cumulative impact would be cumulatively considerable.

Under existing conditions, the Project site is vacant, undeveloped land; thus, it generates very little traffic if any. Existing traffic counts in the study area were collected in May 2014. Those days were representative of typical weekday peak hour traffic conditions in the study area, as no observations were made in the field by Urban Crossroads that would indicate atypical traffic conditions on this date. Intersections along 68th Street and Pats Ranch Road, south of Limonite Avenue, were evaluated during the weekday mid-day peak hour (between 1:00 p.m. and 3:00 p.m)., as schools were also in session and operating on normal schedules at the time the traffic counts were collected. Based on those traffic counts, all intersections in the study area operate at acceptable levels of service (LOS) except for the intersection of Pats Ranch Road/68th Street in the City of Jurupa Valley that operates at LOS "E" in the AM peak hour, whereas LOS "D" is the acceptable standard. Refer to *Technical Appendix I* for more information about existing traffic conditions.

❑ **Project Trip Generation and Distribution**

Trip generation represents the amount of traffic that is attracted to and produced by a development project. Determining traffic generation for a specific project is based upon forecasting the amount of traffic that is expected to be both attracted to and produced by the specific land uses proposed

for a given development. The land uses proposed by the Project are estimated to produce an estimated 2,640 daily vehicle trips, including 202 trips during the AM Peak Hour and 246 trips during the PM Peak Hour. For more information about trip generation, refer to Section 4 in the Traffic Study *(Technical Appendix I*).

Trip distribution is the process of identifying the probable destinations, directions, or traffic routes that would be utilized by Project traffic. The potential interaction between the planned land uses and surrounding regional access routes are considered, to identify the routes where Project traffic would distribute. The trip distribution for the proposed Project was developed based on anticipated travel patterns to and from the Project site for both passenger cars and truck traffic. The trip distribution patterns are heavily influenced by the geographical location of the site, the location of surrounding uses, and the proximity to the regional freeway system. Figure 6-3, *Project Trip Distribution* illustrates the trip distribution patterns for the Project.

The assignment of traffic from the Project area to the adjoining roadway system is based on the Project trip generation, trip distribution, and the arterial highway and local street system improvements that would be in place by the time of Project buildout (2016). Based on the identified Project traffic generation and trip distribution patterns, Project average daily traffic (ADT) volumes and peak hour intersection turning movement volumes are shown on Figure 6-4, *Project Volumes.*

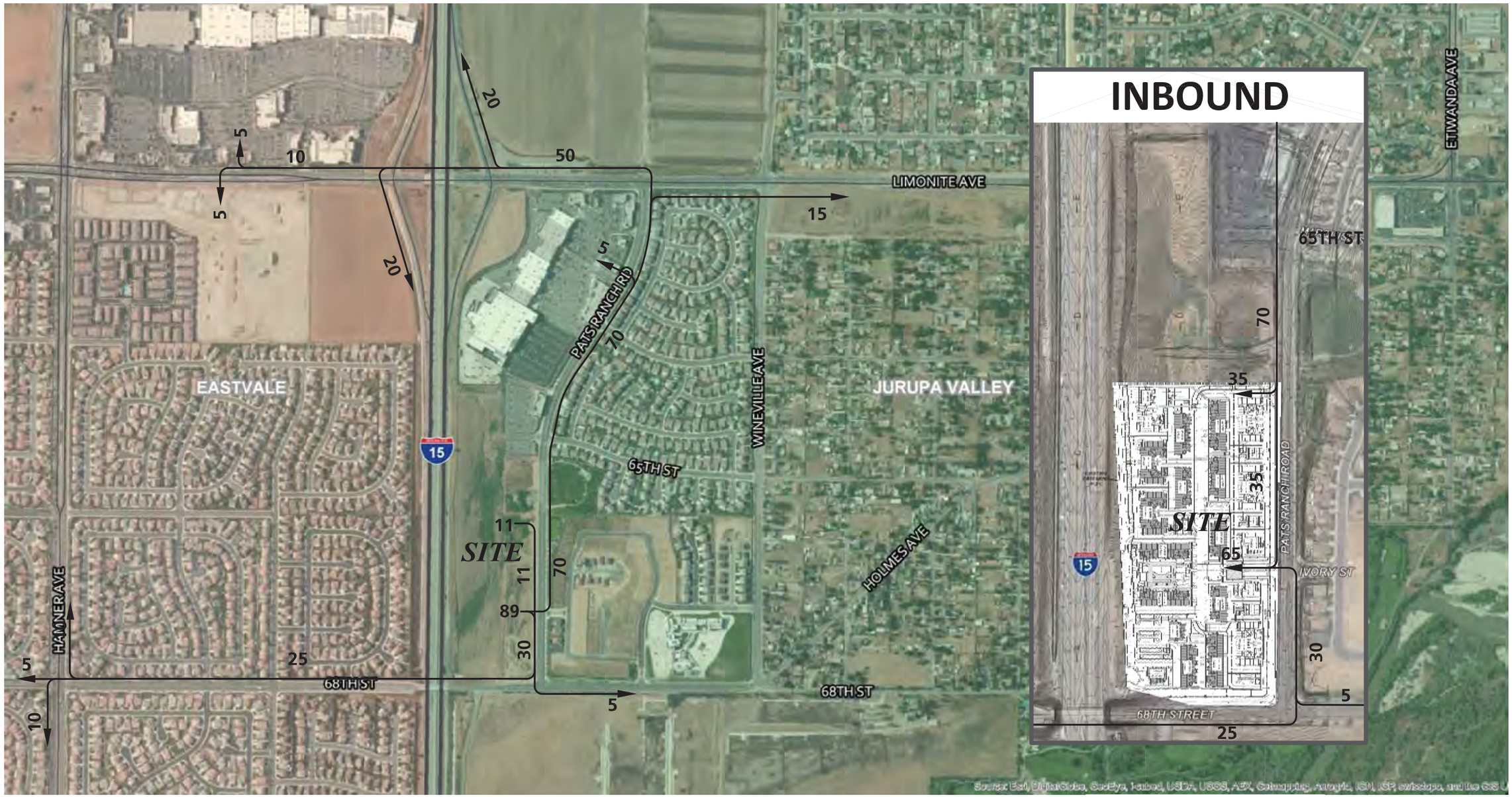
- **Analysis Scenarios**

For the purpose of the proposed Project's traffic impact analysis, potential impacts to traffic and circulation are assessed for each of the conditions listed below.

- Construction Conditions (1 scenario)
- Existing (2014) plus Project Conditions (1 scenario)
- Opening Year (2016) with Project and Opening Year (2016) with Project and cumulative development projects (2 scenarios)
- Horizon Year (2035) without Project and Horizon Year (2035) with Project (2 scenarios)

The Construction Conditions analysis determines the potential for Project construction-related traffic to result in an adverse effect to the local roadway system. Types of traffic anticipated during construction include employees traveling to/from the Project site as well as deliveries of construction materials to the Project site.

The Existing (2014) plus Project (E+P) analysis determines direct Project-related traffic impacts that would occur on the existing roadway system in the theoretical scenario of the Project being placed upon existing conditions. Existing conditions (2014) represents the baseline traffic conditions as they existed at the time the Project's applications were deemed complete by the City of Jurupa Valley. Because the Project is not expected to be fully built and occupied until at least 2016, the E+P scenario is presented to disclose direct impacts as required by CEQA.



LEGEND:

10 ▪ PERCENT TO/FROM PROJECT

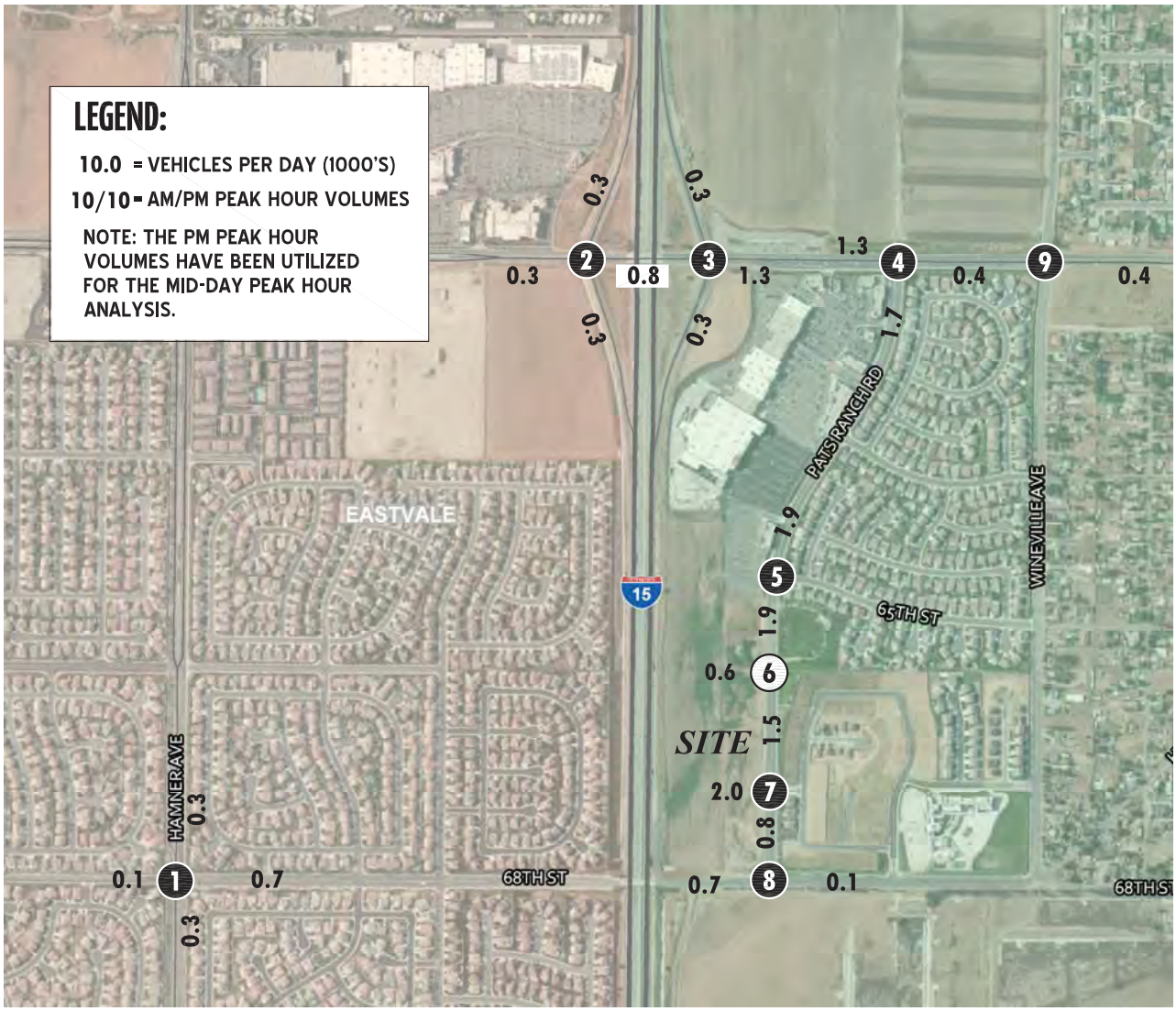
Source(s): Urban Crossroads (12-15-14)

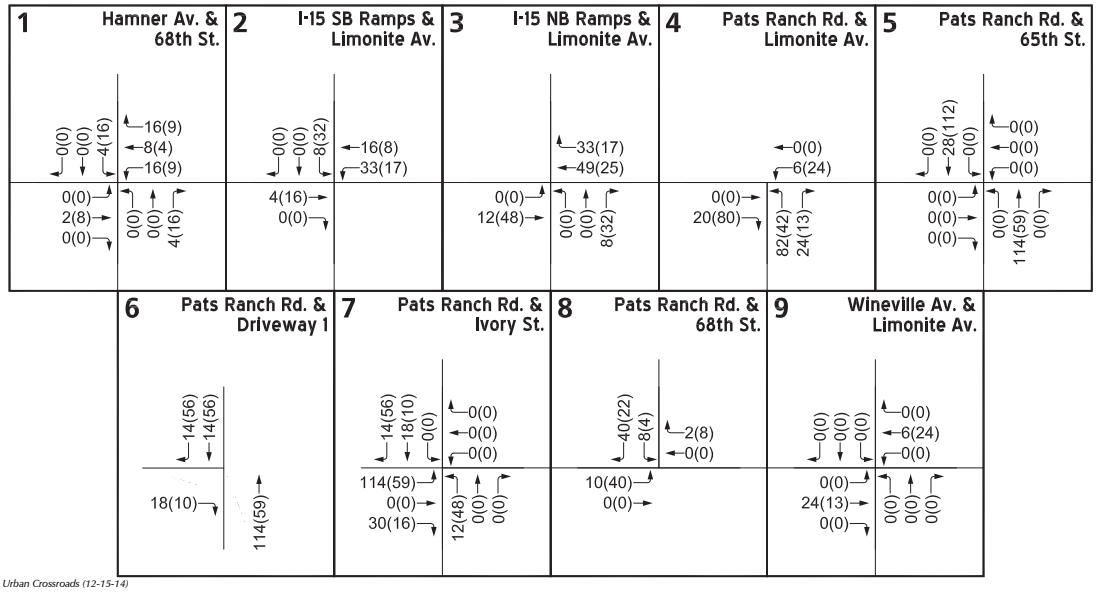
T&B PLANNING, INC.
17542 East 17th Street, Suite 100 Tustin, CA 92780
p. 714.505.6360 f. 714.505.6361
www.tbplanning.com

NOT TO SCALE

Figure 6-3

PROJECT TRIP DISTRIBUTION





Source(s): Urban Crossroads (12-15-14)

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Figure 6-4

PROJECT VOLUMES

The Opening Year (2016) analysis includes an evaluation the Existing plus Ambient Growth plus Project (E+A+P) traffic conditions. The E+A+P analysis is intended to identify the direct impacts associated solely with the development of the proposed Project based on the expected background growth within the study area. The Opening Year (2016) analysis also includes an evaluation of Existing plus Ambient Growth plus Project plus Cumulative Development (E+A+P+C) conditions to identify the Project's potential cumulative contribution to traffic impacts within the study area.

The Horizon Year (2035) conditions analysis is utilized to determine if improvements funded through local and regional transportation mitigation fee programs such as the City of Jurupa Valley Development Impact Fee (DIF) program, County of Riverside Transportation Uniform Mitigation Fee (TUMF) program, Mira Loma Road and Bridge Benefit District (RBBD) program, or other approved funding mechanism can accommodate the long-range cumulative traffic at the target level of service (LOS) identified in the City of Jurupa Valley General Plan. If the "funded" improvements can provide the target LOS, then the Project's payment into mitigation fee program is considered adequate cumulative mitigation as imposed through Conditions of Approval applied to the Project by the City of Jurupa Valley.

If other improvements are needed beyond the "funded" improvements (such as localized improvements to non-TUMF or non-DIF facilities), they are identified as such, and paid for through the Project's calculated fair share contribution.

Near-Term Construction Impact Analysis

During the construction phase of the Project, traffic to-and-from the subject property would be generated by activities such as construction employee trips, import of construction materials, and use of heavy equipment. It is anticipated that up to 72 worker trips and 12 vendor trips would occur per day during the construction phase. These trips represent two-way daily trips, or one trip inbound and one trip outbound. Assuming that all inbound trips occur in the morning and all outbound trips occur in the evening, a total of 42 inbound and 42 outbound trips are estimated. However, this is a conservative estimate as vendor trips are likely to occur throughout the day as opposed to during the morning and evening commute periods. Vehicular traffic associated with 72 worker trips and 12 vendor trips would be minimal and is not expected to result in any adverse effects to the local roadway system.

Construction of the Project would require the import of construction materials to and from the site, including raw building materials, building pad, concrete, parking lot base, asphalt, concrete masonry unit, pipes, landscaping, road base, building equipment, steel roofing, soil, etc. Construction traffic would typically occur during the hours of 6:00 AM and 4:00 PM and will be restricted along 68th Street during the ingress and egress periods of the nearby Vandermolen Elementary School. This traffic will have the least impact if delivery trucks would utilize the most direct route between the site and the I-15 Freeway via Limonite Avenue. Preparation and implementation of a construction traffic management plan will be required to identify specific haul routes for the off-site import and export of excavated materials in excess of 500 c.y. per day and/or 5,000 c.y. for the Project. The plan should also include how delivery vehicles will be accommodated. This will ensure that construction-related truck traffic will have a nominal effect and also result in a less-than-significant impact.

Heavy equipment would be utilized on the Project site during the construction phase, such as flat beds, dozers, scrapers, graders, track hoes, dump trucks, forklifts, cranes, cement trucks, pavers, rollers, water trucks, rolling container trucks and bobcats. As most heavy equipment is not authorized to be driven on a public roadway, most equipment would be delivered and removed from the site via flatbed trucks. Delivery of heavy equipment to the Project site would not occur on a daily basis, but would occur periodically throughout the construction phase based on need. If delivery of heavy construction equipment to the Project site is limited to time periods outside of the morning and evening peak hours, it would have a nominal effect on the local roadway system, and impacts to the roadway system would be less than significant. Preparation and implementation of a construction traffic management plan is recommended to ensure that this occurs; this will ensure that transport of heavy equipment to/from the Project site would have a nominal effect and also result in a less-than-significant impact.

In conclusion, the Project is not anticipated to result in a conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system during near-term construction activities. Impacts during the Project construction phase would be less than significant. Nonetheless, to minimize impacts on local traffic flows and potential nuisance impacts to neighboring land uses, a construction traffic management plan will be implemented, as set forth in Mitigation Measure TR-1.

- **Existing (2016) Plus Project Traffic Impact Analysis (E+P)**

Intersection Operations Analysis

This subsection presents an analysis of existing traffic volumes plus traffic generated by the proposed Project (Existing plus Project, or E+P). This is provided is to disclose the project's traffic impacts if they were to occur within the existing environment, although it is noted that the E+P scenario rarely materializes as an actual scenario in the real world. The time period between the environmental baseline date and the date project buildout occurs can often be a period of several years or more. In the case of the proposed Project, the time period estimated between the City deeming the applications complete (2014) and estimated Project buildout (2016) is two (2) years. During this time period, conditions are not static. Other projects are being constructed, the transportation network is evolving, and traffic patterns are changing. Therefore the E+P scenario is very unlikely to materialize in real world conditions and thus does not accurately describe the environment that would exist when the proposed Project is constructed and becomes operational.

Intersection levels of service for the E+P are summarized in Table 6-16, *Existing and Existing Plus Project Conditions Intersection Analysis* (2014).

Pats Ranch Road is proposed to extend to the south to provide access to the future Riverbend project. As such, a westbound left turn lane will be added as part of the Riverbend project to provide site access. As shown in Table 6-16, for E+P traffic conditions, the intersection analysis results indicate that the addition of Project traffic is not anticipated to result in any additional LOS deficiencies beyond those previously identified for Existing traffic conditions. However, impacts to Pats Ranch Road/68th Street are regarded as a significant, cumulatively considerable impact of the

Project because Project-related traffic would contribute traffic to an already deficient LOS. Therefore, mitigation is required.

Implementation of Mitigation Measure TR-2 would require the Project to contribute its fair share towards improvements to the Pats Ranch Road/68th Street intersection to ensure that adequate LOS can be maintained with the addition of Project traffic. As such, impacts to this intersection would be reduced to less-than-significant levels with adherence to required mitigation.

- **Opening Year (2016) Traffic Impact Analysis (E+A+P)**

Intersection Operations Analysis

The Opening Year (2016) conditions analysis identifies the specific impacts associated solely with the development of the proposed Project based on the expected background growth within the study area (Existing plus Ambient Growth plus Project, or E+A+P). Cumulative development projects within the Project study area are not included within the E+A+P evaluation. Intersection levels of service for the E+A+P condition are summarized in Table 6-17, *Opening Year (E+A+P) Intersection Analysis (2016)*.

As shown in Table 6-17, for E+A+P traffic conditions, the intersection analysis results indicate that the addition of Project traffic is not calculated to result in any additional LOS deficiencies beyond those previously identified for Existing and E+P traffic conditions. However, impacts to Pats Ranch Road/68th Street are regarded as a significant, cumulatively considerable impact of the Project because Project-related traffic would contribute traffic to an already deficient LOS. Therefore, mitigation is required.

Implementation of Mitigation Measure TR-2 below, would require the Project to contribute its fair share towards improvements to the Pats Ranch Road/68th Street intersection to ensure that adequate LOS can be maintained with the addition of Project traffic. As such, impacts to this intersection would be reduced to less-than-significant levels with adherence to required mitigation.

Table 6-16 Existing and Existing Plus Project Conditions Intersection Analysis (2014)

#	Intersection	Traffic Control[2]	Existing (2014)						E+P						Acceptable
			Delay [1] (secs.)			Level of Service			Delay [1] (secs.)			Level of Service			
			AM	Mid	PM	AM	Mid	PM	AM	Mid	PM	AM	Mid	PM	LOS
1	Hamner Av. / 68th Street	TS	37.8	28.8	29.7	D	C	C	38.9	30.0	30.6	D	C	C	D
2	I-15 SB Ramps / Limonite Av.	TS	30.2	N/A	33.0	C	N/A	C	30.9	N/A	33.9	C	N/A	C	D
3	I-15 NB Ramps / Limonite Av.	TS	32.7	N/A	37.7	C	N/A	D	33.3	N/A	41.1	C	N/A	D	D
4	Pats Ranch Rd. / Limonite Av.	TS	10.5	N/A	15.1	B	N/A	B	11.9	N/A	17.1	B	N/A	B	D
5	Pats Ranch Rd. / 65th St.	TS	12.5	12.3	15.5	B	B	B	12.5	12.3	15.5	B	B	B	D
6	Pats Ranch Rd. / Driveway 1	**CSS**	--	--	--	--	--	--	9.0	9.5	9.6	A	A	A	D
7	Pats Ranch Rd. / Ivory St.	CSS	16.3	16.4	12.0	C	C	B	18.5	19.5	14.7	C	C	B	D
8	Pats Ranch Rd. / 68th St.	AWS	**48.1**	23.3	13.5	**E**	C	B	**56.0**	28.7	14.8	**F**	D	B	D
9	Wineville Av. / Limonite Av.	TS	22.0	N/A	27.3	C	N/A	C	22.0	N/A	27.3	C	N/A	C	D

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

N/A = Not applicable. Intersection not evaluated during the mid-day peak hour.

[1]Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[2]CSS = Cross-street Stop; AWS = All-Way Stop; TS = Traffic Signal; **CSS** = Improvement

Source: Urban Crossroads, 2014e, Table 5-1

Table 6-17 Opening Year (E+A+P) Intersection Analysis (2016)

#	Intersection	Traffic Control[2]	Existing (2014)						EAP (2016)						Acceptable LOS
			Delay [1] (secs.)			Level of Service			Delay [1] (secs.)			Level of Service			
			AM	Mid	PM	AM	Mid	PM	AM	Mid	PM	AM	Mid	PM	
1	Hamner Av. / 68th Street	TS	37.8	28.8	29.7	D	C	C	39.9	30.5	31.1	D	C	C	D
2	I-15 SB Ramps / Limonite Av.	TS	30.2	N/A	33.0	C	N/A	C	31.4	N/A	35.6	C	N/A	D	D
3	I-15 NB Ramps / Limonite Av.	TS	32.7	N/A	37.7	C	N/A	D	34.3	N/A	44.8	C	N/A	D	D
4	Pats Ranch Rd. / Limonite Av.	TS	10.5	N/A	15.1	B	N/A	B	12.1	N/A	18.1	B	N/A	B	D
5	Pats Ranch Rd. / 65th St.	TS	12.5	12.3	15.5	B	B	B	12.5	12.3	15.5	B	B	B	D
6	Pats Ranch Rd. / Driveway 1	**CSS**	--	--	--	--	--	--	9.0	9.5	9.7	A	A	A	D
7	Pats Ranch Rd. / Ivory St.	CSS	16.3	16.4	12.0	C	C	B	19.1	20.2	14.9	C	C	B	D
8	Pats Ranch Rd. / 68th St.	AWS	**48.1**	23.3	13.5	**E**	C	B	**65.8**	32.9	15.5	**F**	D	C	D
9	Wineville Av. / Limonite Av.	TS	22.0	N/A	27.3	C	N/A	C	22.0	N/A	27.3	C	N/A	C	D

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

N/A = Not applicable. Intersection not evaluated during the mid-day peak hour.

[1]Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[2]CSS = Cross-street Stop; AWS = All-Way Stop; TS = Traffic Signal; CSS = Improvement

Source: Urban Crossroads, 2014e, Table 6-1

Progression Analysis

A progression analysis was performed for the E+A+P scenario to evaluate the performance of Limonite Avenue between I-15 and Wineville Avenue during peak hours. The traffic progression analysis assesses the potential needs of the intersections with traffic added from the proposed Project. Queues (i.e., stacking distance) reported are based upon the 95th percentile queues resulting from the progression analysis. The 95th percentile queue is longest projected traffic queue up to 95 percent of the queues that occur. Or, only 5 percent of the queues are projected to exceed this length. The queue length reported is for the lane with the highest queue in the lane group. The stacking distances along Limonite Avenue under the E+A+P traffic conditions are summarized in Table 6-2 of the TIA, which indicates that the following movements may potentially experience queuing issues during the peak 95th percentile traffic flows (Urban Crossroads, 2014e, p. 69):

For Pats Ranch Road/Limonite Avenue the westbound left lane will not provide adequate storage to accommodate 95th percentile EAP (2016) vehicle queues during the AM and PM peak hours. This could potentially result in vehicles spilling back into the adjacent westbound through lane and may affect peak hour operations at Wineville Avenue. The recommendation in the traffic report is to lengthen the westbound left turn lane to 250 feet to accommodate the 95th percentile queues. This will be implemented as a project condition of approval and through Mitigation Measure TR-5.

For Wineville Avenue/Limonite Avenue the westbound left turn lane will not provide adequate storage to accommodate 95th percentile EAP (2016) vehicle queues during the PM peak hour only. This could potentially result in vehicles spilling back into the adjacent westbound through lane. The recommendation in the traffic report is to lengthen the westbound left turn lane to 300 feet to accommodate 95th percentile queues. This will be implemented as a project condition of approval and through Mitigation Measure TR-6.

❑ **Opening Year (2016) Plus Cumulative Traffic Impact Analysis (E+A+P+C)**

Intersection Operations Analysis

Traffic within the Project study area from development projects that are approved and not yet constructed, along with developments that are currently in the process of entitlement, have been added to the E+A+P traffic volumes to represent Existing plus Ambient Growth plus Project plus Cumulative Development conditions (E+A+P+C). The purpose of this analysis is to determine if the Project in conjunction with nearby development projects has the potential to result in traffic impacts that are individually less than significant but considerable on a cumulative basis. Intersection levels of service for the E+A+P+C (2016) scenario are summarized in Table 6-18, *Opening Year Plus Cumulative Condition (E+A+P+C) Intersection Analysis (2016)*.

As shown in Table 6-18, for E+A+P+C (2016) traffic conditions the following study area intersections are projected to operate at unacceptable levels of service (LOS) during peak hours:

- I-15 Southbound Ramps/Limonite Avenue in the AM and PM Peak Hours;
- I-15 Northbound Ramps/Limonite Avenue in the AM and PM Peak Hours; and
- Pats Ranch Road/68th Street in the AM Peak Hour and Mid-day Peak Hour.

Table 6-18 Opening Year Plus Cumulative Condition (E+A+P+C) Intersection Analysis (2016)

#	Intersection	Traffic Control[2]	EAPC (2016)						Acceptable LOS
			Delay [1] (secs.)			Level of Service			
			AM	Mid	PM	AM	Mid	PM	
1	Hamner Av. / 68th Street	TS	46.9	35.3	34.6	D	D	C	D
2	I-15 SB Ramps / Limonite Av.	TS	**59.7**	N/A	**87.0**	**E**	N/A	**F**	D
3	I-15 NB Ramps / Limonite Av.	TS	**71.5**	N/A	**65.1**	**E**	N/A	**E**	D
4	Pats Ranch Rd. / Limonite Av.	TS	26.2	N/A	40.9	C	N/A	D	D
5	Pats Ranch Rd. / 65th St.	TS	12.5	12.3	15.5	B	B	B	D
6	Pats Ranch Rd. / Driveway 1	**CSS**	9.2	10.1	10.2	A	B	B	D
7	Pats Ranch Rd. / Ivory St.	CSS	24.1	28.7	17.7	C	D	C	D
8	Pats Ranch Rd. / 68th St.	AWS	**87.3**	**47.8**	18.4	**F**	**E**	C	D
9	Wineville Av. / Limonite Av.	TS	26.6	N/A	54.4	C	N/A	D	D

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).
N/A = Not applicable. Intersection not evaluated during the mid-day peak hour.
[1]Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.
[2]CSS = Cross-street Stop; AWS = All-Way Stop; TS = Traffic Signal; CSS = Improvement
Source: Urban Crossroads, 2014e, Table 7-1

The proposed Project would contribute to, but would not directly cause, cumulatively significant impacts at the above-listed intersections. Accordingly, impacts to the above-listed intersections are significant on a cumulative basis under E+A+P+C (2016) conditions and mitigation is required because the Project's contribution to this impact is cumulatively considerable.

Implementation of Mitigation Measure TR-2 through Mitigation Measure TR-4 below, would require the Project to participate local and regional mitigation fee programs and contribute its fair share towards improvements to these intersections to ensure that adequate LOS can be maintained with the Project's contribution of cumulative traffic to the local roadways and intersections. As such, impacts to these intersections would be reduced to less-than-significant levels with adherence to required mitigation.

The proposed Project would contribute to, but would not directly cause, cumulatively significant impacts at the above-listed intersections. Accordingly, impacts to the above-listed intersections are significant on a cumulative basis under E+A+P+C (2016) conditions and mitigation is required because the Project's contribution to this impact is cumulatively considerable.

Implementation of Mitigation Measure TR-2 through Mitigation Measure TR-4 below, would require the Project to participate local and regional mitigation fee programs and contribute its fair share towards improvements to these intersections to ensure that adequate LOS can be maintained with the Project's contribution of cumulative traffic to the local roadways and intersections. As

such, impacts to these intersections would be reduced to less-than-significant levels with adherence to required mitigation.

Progression Analysis

A progression analysis was performed for the E+A+P+C scenario to evaluate the performance of Limonite Avenue between I-15 and Wineville Avenue, and for the I-15/Limonite Avenue interchange ramps during peak hours. The stacking distances along Limonite Avenue and the freeway ramps under the E+A+P+C traffic conditions are summarized in Table 7-2 of the TIA, which indicates that the following movements could experience queuing problems during the peak 95th percentile traffic flows:

For I-15 Southbound Ramps/Limonite Avenue, the eastbound through lane will not provide adequate storage to accommodate 95th percentile EAPC (2016) vehicle queues during the AM and PM peak hours. This will result in vehicles spilling back and may affect the peak hour operations at the signalized Eastvale Gateway intersection.

For the I-15 Northbound Ramps/Limonite Avenue, the northbound left turn and northbound right turn lanes will not provide adequate storage to accommodate 95th percentile EAPC (2016) vehicle queues during the PM peak hour only. This will result in vehicles spilling back into the adjacent northbound through lane. However, these queues are not anticipated to spill back onto the I-15 Freeway mainline.

For the I-15 Northbound Ramps/Limonite Avenue, the westbound through lane will not provide adequate storage to accommodate 95th percentile EAPC (2016) vehicle queues during the AM and PM peak hours. This will result in vehicles spilling back and may affect the peak hour operations at Pats Ranch Road.

For Pats Ranch Road/Limonite Avenue, the westbound Left turn lane will not provide adequate storage to accommodate 95th percentile EAPC (2016) vehicle queues during the AM and PM peak hours. This will result in vehicles spilling back into the adjacent westbound through lane and may affect peak hour operations at Wineville Avenue.

For Wineville Avenue/Limonite Avenue, the westbound Left turn lane will not provide adequate storage to accommodate 95th percentile EAPC (2016) vehicle queues during the PM peak hour only. This will result in vehicles spilling back into the adjacent westbound through lane.
Recommended improvements to address queuing problems are as follows:

The 95th percentile queues for EAPC (2016) traffic conditions, *with improvements identified in the Traffic Study*, indicates there are projected queuing issues anticipated during the weekday peak hours. Improvements assumed include the third eastbound and third westbound through lanes across the bridge over the I-15 Freeway along Limonite Avenue. Improvements also include adjusting traffic signal cycle lengths for all intersections along Limonite Avenue (assumed as part of the coordinated system), optimal green time splits for turning movements at each intersection, and the turn pocket lengthening recommendations as discussed above. With these proposed improvements, it is anticipated that there would be no queuing issues, with the exception of the

intersection of Pats Ranch Road at Limonite Avenue. An additional 50 feet, for a total of 300-fee of stacking, is necessary to accommodate the anticipated 95th percentile queues for the westbound left turn lane at Pats Ranch Road, which can be accommodated through restriping. The Project would be required to contribute funds toward the improvements identified in the Traffic Impact Assessment pursuant to Mitigation Measures TR-2 through TR-6. As such, the proposed Project's near-term and long-term cumulative impact to these intersections would be reduced to less-than-significant levels with adherence to required mitigation.

- **Horizon Year (2035) Traffic Impact Analysis**

The Horizon Year (2035) conditions analysis is utilized to determine if improvements anticipated in long-term planning documents such as the City of Jurupa Valley General Plan are adequate to accommodate long-term cumulative traffic conditions at the target LOS, or if additional mitigation is necessary. Intersection levels of service for the Horizon Year scenario are summarized in Table 6-19, *Horizon Year Intersection Analysis (2035)*.

As shown in Table 6-19, under Horizon Year traffic conditions the following study area intersections are projected to operate at unacceptable levels of service (LOS) during peak hours:

- I-15 Southbound Ramps/Limonite Avenue in AM and PM Peak Hours;
- I-15 Northbound Ramps/Limonite Avenue in the PM Peak Hour;
- Pats Ranch Road/Limonite Avenue in the AM and PM Peak Hours;
- Pats Ranch Road/68th Street in the AM, Mid-day and PM Peak Hours; and
- Wineville Avenue/Limonite Avenue in the AM and PM Peak Hours.

Upon construction of the roadway improvements planned by the City of Jurupa General Plan and partially funded by existing traffic improvements programs (i.e., Mira Loma RBBD, Western Riverside TUMF, City of Jurupa Valley DIF), intersections in the Project study area would operate at the LOS shown in Table 6-20, *Horizon Year Intersection Analysis – With Improvements (2035)*. The Project would be required to contribute funds toward the improvements identified in Table 6-20 pursuant to Mitigation Measures TR-2 through TR-6. As such, the proposed Project's near-term and long-term cumulative impact to these intersections would be reduced to less-than-significant levels with adherence to required mitigation.

A queuing analysis was performed for the southbound and northbound off-ramps at the I-15/Limonite Avenue interchange, to determine whether there could be significant vehicle queues that could result in deficient peak hour operations at the ramp-to-arterial intersections and potentially "spill back" onto the I-15 Freeway mainline. This analysis found that there will be queuing problems during the PM peak hour at the northbound ramps, where queues could exceed the turn pocket lengths and could spillback into the adjacent through lanes and potentially onto the I-15 Freeway mainline. With programmed improvements planned for the interchange, and additional geometric improvements to increase traffic capacity identified in the Traffic Study, the potential queuing problem noted above would be eliminated. These improvements would also include optimal cycle lengths for all intersections along Limonite Avenue (assumed as part of the

Table 6-19 Horizon Year Intersection Analysis (2035)

#	Intersection	Traffic Control[2]	2035 Without Project						2035 With Project						Acceptable LOS
			Delay [1] (secs.)			Level of Service			Delay [1] (secs.)			Level of Service			
			AM	Mid	PM	AM	Mid	PM	AM	Mid	PM	AM	Mid	PM	
1	Hamner Av. / 68th Street	TS	48.7	47.8	49.6	D	D	D	52.0	50.8	53.2	D	D	D	D
2	I-15 SB Ramps / Limonite Av.	TS	**>200.0**	N/A	**98.4**	**F**	N/A	**F**	**>200.0**	N/A	**98.4**	**F**	N/A	**F**	D
3	I-15 NB Ramps / Limonite Av.	TS	54.6	N/A	**138.4**	D	N/A	**F**	**61.3**	N/A	**145.4**	**E**	N/A	**F**	D
4	Pats Ranch Rd. / Limonite Av.	TS	**120.2**	N/A	**>200.0**	**F**	N/A	**F**	**129.6**	N/A	**>200.0**	**F**	N/A	**F**	D
5	Pats Ranch Rd. / 65th St.	TS	19.3	14.9	25.9	B	B	C	49.2	14.4	27.6	D	B	C	D
6	Pats Ranch Rd. / Driveway 1	**CSS**	--	--	--	--	--	--	9.6	10.7	11.1	A	B	B	D
7	Pats Ranch Rd. / Ivory St.	CSS	28.6	25.7	15.6	D	D	C	30.7	34.8	27.9	D	D	D	D
8	Pats Ranch Rd. / 68th St.	AWS	**>100.0**	**>100.0**	**85.0**	**F**	**F**	**F**	**>100.0**	**>100.0**	**99.2**	**F**	**F**	**F**	D
9	Wineville Av. / Limonite Av.	TS	**77.2**	N/A	**>200.0**	**E**	N/A	**F**	**77.7**	N/A	**>200.0**	**F**	N/A	**F**	D

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

N/A = Not applicable. Intersection not evaluated during the mid-day peak hour.

[1]Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[2]CSS = Cross-street Stop; AWS = All-Way Stop; TS = Traffic Signal; CSS = Improvement

Source: Urban Crossroads, 2014e, Table 8-1

Table 6-20 Horizon Year Intersection Analysis – With Improvements (2035)

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)			Level of Service		
			Northbound			Southbound			Eastbound			Westbound								
			L	T	R	L	T	R	L	T	R	L	T	R	AM	Mid	PM	AM	Mid	PM
2	I-15 SB Ramps / Limonite Av.																			
	- Horizon Year (2035) Without Project	TS	0	0	0	1	1	**2**	0	**3**	1	**0**	**3**	**1**	9.8	N/A	8.6	A	N/A	A
	- Horizon Year (2035) With Project	TS	0	0	0	1	1	**2**	0	**3**	1	**0**	**3**	**1**	10.5	N/A	8.7	B	N/A	A
3	I-15 NB Ramps / Limonite Av.																			
	- Horizon Year (2035) Without Project	TS	1	1	**2**	0	0	0	**0**	**3**	**1**	0	**3**	1	15.6	N/A	26.3	B	N/A	C
	- Horizon Year (2035) With Project	TS	1	1	**2**	0	0	0	**0**	**3**	**1**	0	**3**	1	16.4	N/A	27.6	B	N/A	C
4	Pats Ranch Rd. / Limonite Av.																			
	- Horizon Year (2035) Without Project	TS	2	**1**	**1>**	**1**	**1**	**1>**	**1**	**3**	**1>**	**2**	**3**	**1**	20.6	N/A	45.8	C	N/A	D
	- Horizon Year (2035) With Project	TS	2	**1**	**1>**	**1**	**1**	0**1>**	**1**	**3**	**1>**	**2**	**3**	**1**	23.1	N/A	52.0	C	N/A	D
8	Pats Ranch Rd. / 68th St.																			
	- Horizon Year (2035) Without Project	**TS**	**1**	**1**	0	1	**1**	**1>**	**1**	**2**	0	**1**	2	1	30.9	43.1	40.6	C	D	D
	- Horizon Year (2035) With Project	**TS**	**1**	**1**	0	1	**1**	**1>**	**1**	**2**	0	**1**	2	1	52.8	54.9	40.8	C	D	D
9	Wineville Av. / Limonite Av.																			
	- Horizon Year (2035) Without Project	TS	1	2	0	1	**2**	**1>**	**2**	**3**	**0**	**2**	**3**	0	20.3	N/A	37.3	C	N/A	D
	- Horizon Year (2035) With Project	TS	1	2	0	1	**2**	**1>**	**2**	**3**	**0**	**2**	**3**	0	20.3	N/A	38.0	C	N/A	D

N/A = Not applicable. Intersection not evaluated during the mid-day peak hour.

[1]When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right; > = Right-Turn Overlap Phasing; >> = Free-Right Turn Lane; **1** = Improvement

[2]Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control.

[3]TS = Traffic Signal

Source: Urban Crossroads 2014e, Table 8-3

coordinated system) and optimal green time splits for turning movements at each intersection. This Project will be required to pay fair share fees to help fund these long range interchange improvements, as required by the Project conditions of approval and Mitigation Measures TR-3 and TR-4.

Mitigation

Mitigation Measure TR-1:
Prior to issuance of grading permits and building permits, a construction traffic management plan shall be submitted for approval by the City's Building Official. This plan shall identify route restrictions, hourly restrictions, locations of staging and storage areas, locations of work crew parking, etc., to minimize impacts during morning and afternoon peak commute periods and to prohibit routing of truck traffic through any neighboring residential areas.

Mitigation Measure TR-2: Prior to the issuance of the Project's first building permit, the Project Proponent shall pay to the City of Jurupa Valley a fair share contribution to assure the construction of the geometric improvements specified in the Project conditions of approval at the intersection of Pats Ranch Road/68th Street.

Mitigation Measure TR-3: Prior to the issuance of the Project's first building permit, the Project Proponent shall pay fees required by the Riverside County TUMF and RBBD programs to assure the construction of the geometric improvements specified in the Project conditions of approval to the intersection of I-15 Southbound Ramps/Limonite Avenue.

Mitigation Measure TR-4: Prior to the issuance of the Project's first building permit, the Project Proponent shall pay fees required by Riverside County TUMF and RBBD programs to assure the construction of the geometric improvements specified in the Project conditions of approval to the intersection of I-15 Northbound Ramps/Limonite Avenue.

Mitigation Measure TR-5: Prior to the issuance of the Project's first occupancy permit, the Project Proponent shall pay fees required by the Riverside County TUMF program and its fair share contribution toward improvements not programmed by TUMF to assure the construction of the geometric improvements specified in the Project conditions of approval to the intersection of Pats Ranch Road/Limonite Avenue.

Mitigation Measure TR-6: Prior to the issuance of the Project's first occupancy permit, the Project Proponent shall pay fees required by the Riverside County TUMF program and its fair share contribution toward improvements not programmed by TUMF to assure the construction of the geometric improvements specified in the Project conditions of approval to the intersection of Wineville Avenue/Limonite Avenue.

6.16(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?

Finding: Less-than-Significant Impact with Mitigation Incorporated

(Sources: Traffic Impact Analysis, 2014e; 2011 Riverside County Congestion Management Program)

The 2011 Riverside County Congestion Management Program (CMP) was prepared by the Riverside County Transportation Commission (RCTC) in accordance with Proposition 111, passed in June 1990. The CMP was established in the State of California to more directly link land use, transportation, and air quality and to prompt reasonable growth management programs that would more effectively utilize new and existing transportation funds, alleviate traffic congestion and related impacts, and improve air quality. Deficiencies along the CMP system are identified by RCTC when they occur so that improvement measures can be identified. Understanding the reason for these deficiencies and identifying ways to reduce the impact along a critical CMP corridor is intended to conserve scarce funding resources and help target those resources appropriately.

In the vicinity of the Project site, I-15/Limonite interchange ramps are the only CMP intersections that receive 50 or more peak hour trips from the Project. The RCTC has adopted LOS "E" as the minimum standard for intersections and segments along the CMP System of Highways and Roadways. As described above under the response to Issue 6.16(a), implementation of the proposed Project would result in significant direct and cumulatively considerable impacts to the I-15/Limonite interchange ramps; however, these impacts would be reduced to less-than-significant levels with implementation of required mitigation measures (i.e., Mitigation Measures TR-3 through TR-4). Accordingly, implementation of the Project would not conflict with the applicable CMP, including LOS standards, and impacts would be less than significant with mitigation.

Mitigation

Mitigation Measures TR-3 and TR-4 shall apply.

6.16(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?

Finding: No Impact

(Source: Project Application Materials)

The Project site is not in the vicinity of any public or private airfield and the Project does not include an air travel component (e.g., runway, helipad, etc.). Accordingly, the Project would not have the potential to affect air traffic patterns, including an increase in traffic levels or a change in flight path location that results in substantial safety risks. No impact would occur.

Mitigation

No mitigation is required.

6.16(d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Finding: Less-than-Significant Impact

(Sources: Traffic Impact Analysis, 2014e; Google Earth; Project Application Materials)

The residential apartment complex land uses proposed by the Project would be compatible with existing development in the surrounding area; therefore, implementation of the Project would not create a transportation hazard as a result of an incompatible use. The Project proposes to construct physical frontage improvements to Pats Ranch Road and 68th Street in conformance with City standards, including but not limited to striping, streetscape improvements, and location and design of site access improvements. With the implementation of these improvements, the Project would provide adequate vehicular and pedestrian safety and ensure that no hazardous transportation design features would be introduced by the Project. Accordingly, the Project would not substantially increase hazards due to a design feature or incompatible use. Impacts would be less than significant and mitigation is not required.

Mitigation

No mitigation is required.

6.16(e) Result in inadequate emergency access?

Finding: Less-than-Significant Impact

(Source: Project Application Materials)

Buildout of the proposed Project would result in a new residential apartment community, which would increase the need for emergency access to-and-from the site. During the course of the City of Jurupa Valley's required review of the proposed Project, the Project's transportation design was reviewed by the City's Engineering Department to ensure that adequate access to and from the site would be provided for emergency vehicles. Both Project driveways will be equipped with electronically activated gates, as a security measure. Residents and property management personnel would be provided with electronic remote control devices for entry and exit. Emergency responders (Sheriff, Fire Department and ambulance services) would have access via a "Knox Box" where master keys to open the gates electronically, or manually in the case of an electronic malfunction, will be provided within a secured location on-site. Furthermore, Conditions of Approval will be issued by the City prior to consideration of the proposed Project by City Council, which will require that the Project provide adequate paved access to-and-from the site. With required adherence to City requirements for emergency vehicle access, impacts would be less than significant.

Mitigation

No mitigation is required.

6.16(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?

Finding: Less-than-Significant Impact

(Sources: Traffic Impact Analysis, 2014e; Project Application Materials)

The Project is designed to comply with all applicable transportation policies, plans, and programs. The Project would dedicate public right-of-way and improve 68th Street in accordance with City standards, as well as implement various other circulation improvements, including the installation of traffic control signage, crosswalks at the intersection of 68th St. and Pats Ranch Road, and sidewalks along the Project frontages to facilitate safe pedestrian circulation. In addition, Project residents would be able to access to the planned Community Trail along the south side of 68th Street and the existing Regional Trail to the southwest via the planned sidewalk improvements and crosswalks at the intersection of Pats Ranch Road and 68th Street. The Project also would accommodate pedestrians via on-site sidewalks. Riverside Transit Authority (RTA) operates a public bus route along Pats Ranch Road (i.e., Route 3 and 29) and implementation of the Project would not interfere with the operation of this transit route.

Accordingly, the proposed Project would not conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. Impacts would be less than significant and no mitigation would be required.

Mitigation

No mitigation is required.

6.17 UTILITIES AND SERVICE SYSTEMS

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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, which 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?			✓	

Impact Analysis

6.17(a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

Finding: Less-than-Significant Impact

(Sources: Project Application Materials; JCSD Water and Sewer Availability Letter, 2014)

Wastewater treatment and collection services would be provided to the proposed Project by the Jurupa Community Services District (JCSD). JCSD has estimated that this Project would generate approximately 0.23 million gallons per day (MGD) of wastewater, based on a per unit factor of 180 gallons per day (GPD). Wastewater generated by the proposed Project would be treated at the Western Riverside County Regional Wastewater Treatment Plant (WRCRWTP), which is owned and

operated by the Western Riverside County Regional Wastewater Authority (WRCRWA). WRCRWA is required to operate the Western Riverside County Regional Wastewater Treatment Plant in accordance with the waste treatment and discharge standards and requirements set forth by the Regional Water Quality Control Board (RWQCB). The proposed Project would discharge all wastewater generated in the apartment buildings and the clubhouse/fitness center to a sanitary sewer line in the adjacent segment of 68th Street, where it would flow into sewer mains that convey sewage to the WRCRWTP. The Project's wastewater would be comprised of the same kinds of pollutant elements that are typically found in domestic wastewater generated within residential uses and would not require any unusual treatment processes that are not already in place at the Treatment Plant. As such, the Project would have no potential to exceed the applicable wastewater treatment requirements established by the RWQCB. Accordingly, impacts would be less than significant.

Mitigation

No mitigation is required.

6.17(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?

Finding: Less-than-Significant Impact

(Sources: Project Application Materials; Jurupa Community Services District (JCSD) Water and Sewer Availability Letter, 2014; JCSD 2010 Urban Water Management Plan)

Water service would be provided to the proposed Project by the JCSD. Under existing conditions, water service is available from an existing 18-inch diameter water line in Pats Ranch Road east of the Project boundary (JCSD, 2014). Eight-inch diameter water lines would be installed on the Project site to provide two connections to the existing 18-inch diameter water line in Pats Ranch Road and would provide onsite domestic water, irrigation water, and water for fire protection services. For a second supply connection, the JCSD requires that approximately 500 linear feet of offsite water lines be constructed across I-15 to connect to another existing 18-inch diameter water line in 68th Street west of I-15. Additionally, each existing line would need to be interconnected by completing the loop in 68th Street south of the Project boundary (Jurupa Community Services District, 2014). This line is a JCSD master planned line and the Project Applicant would be eligible for JCSD fee credit for its installation. This secondary supply connection was also required for the previously approved Riverbend project, located on undeveloped land immediately to the south, and may be built by that project if it occurs before the proposed Project is under construction. JCSD has not identified any deficiencies in the affected segments of the existing water main system and has indicated that the existing water mains are adequate to provide the water service required for this Project.

Sanitary sewer service to the Project site would be provided by the JCSD. Sewer service would be provided to the site from an existing 18-inch diameter sewer line in Pats Ranch Road east of the Project site and from an existing 21-inch diameter sewer line in 68th Street south of the Project boundary (JCSD, 2014). Eight-inch diameter sewer lines would be installed onsite that would

connect to the existing sewer lines in the adjacent streets. JCSD has not identified any deficiencies in the affected segments of the existing sewer main system and has indicated that there is sufficient capacity in both the Pats Ranch Road and 68th Street sewers to handle the wastewater from this Project. The proposed 397 unit Project is not large enough to require or result in construction of new wastewater treatment facilities or expansion of existing facilities to meet the anticipated wastewater treatment demands of the proposed Project. Refer to Threshold 6.17(e) for additional information.

The installation of water and sewer lines as proposed by the Project would result in physical impacts to the surface and subsurface of infrastructure alignments. This also includes the possible extension of 500 feet of JCSD water line along 68th Street across the I-15 as noted above. The short-term construction impacts would involve typical minor levels of air pollutants from excavation activities and construction machinery and vehicle emissions, increased localized noise, and occasional traffic disruption. These impacts are considered to be part of the Project's construction phase and are evaluated throughout this IS/MND accordingly. In instances where significant impacts have been identified for the Project's construction phase, mitigation measures are recommended in each applicable subsection of this IS/MND to reduce impacts to less-than-significant levels. The construction of water and sewer lines as necessary to serve the proposed Project would not result in any significant physical effects on the environment that are not already identified and disclosed as part of this IS/MND. Accordingly, additional mitigation measures beyond those identified throughout this Initial Study would not be required.

Mitigation

No mitigation is required.

6.17(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?

Finding: Less-than-Significant Impact

(Source: Project Application Materials; Drainage Study Report, 2014)

The proposed Project would construct an underground pipe network to collect runoff from throughout the site and convey drainage flows into an underground water quality/detention basin in the southwestern corner of the site. This basin would be equipped with filtration mechanisms to remove water pollutants and to regulate outflows into an existing underground RCFCWCD storm drainage structure (Line "J) that runs along the western boundary of the site. No modifications to the County's storm drain would be required for this Project.

The construction of storm drain lines, V-gutters, an underground infiltration basin, and grate inlets as proposed by the Project would result in physical impacts to the surface and subsurface of the Project site. These impacts are considered to be part of the Project's construction phase and are evaluated throughout this IS/MND accordingly. In instances where significant impacts have been identified for the Project's construction phase, mitigation measures are recommended in each applicable subsection of this Initial Study to reduce impacts to less-than-significant levels. The

construction of storm drain infrastructure on-site as necessary to serve the proposed Project would not result in any significant physical effects on the environment that are not already identified and disclosed as part of this IS/MND. Accordingly, additional mitigation measures beyond those identified throughout this IS/MND would not be required.

Mitigation

No mitigation is required.

6.17(d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Finding: Less-than-Significant Impact

(Sources: Project Application Materials; JCSD 2010 Urban Water Management Plan; JCSD Water and Sewer Availability Letter, 2014)

Water service to the proposed Project would be provided by JCSD. According to the 2010 JCSD Urban Water Management Plan, the JSCD relies predominantly on groundwater and desalinated brackish groundwater from the Chino Groundwater Basin. A detailed account of current and projected JCSD water supplies is available in JSCD's Urban Water Management Plan, which is herein incorporated by reference and available for review at JCSD, 11201 Harrel Street, Jurupa Valley, CA 91752 or online at www.jcsd.us. According to JCSD's 2010 Urban Water Management Plan, JCSD has 16 wells, 8 booster stations, and 15 reservoirs of 53.7 million-gallon capacity. In order to ensure a continuing supply of good quality water for current citizens and also future development, JSCD participates in a Joint Powers Authority (JPA) with other neighboring water purveyors, called the Chino Desalter Authority (CDA). The CDA owns and operates two water treatment plants (Desalters) for the removal of Total Dissolved Solids (TDS) and nitrates (NO_3) in the Chino Basin, along with the necessary wells, pipelines, booster pump stations and reservoirs for the delivery of this highly treated water. Both Desalters utilize Reverse Osmosis (RO) and Ion Exchange (IX) treatment processes to remove the nitrates from the groundwater. The treatment capacity for each plant is 12 million gallons/day (MGD). JCSD has a contractual obligation to purchase 10.9 MGD (11,500 acre feet per year (AFY)).

The JCSD's current water supply exceeds the projected maximum day demand projected for the years 2013-2018. For example, the JCSD's water demand for 2014 is 29,824 gallons per minute (GPM), while the supply is 40,509 GPM. In 2018 the estimated water demand is 33,850 GPM, while the estimated supply is 47,559 GPM (JCSD, 2014). Additionally, as detailed in the JCSD 2010 Urban Water Management Plan, JCSD has identified adequate supplies to meet demands during normal, single-dry, and multiple-dry years throughout the 25-year planning period (2010 thru 2035).

Estimated daily and peak domestic water demands and fire department demands for development of the Project (in gallons per minute (gpm)) are as follows:

- Average Demand= 17 ac x 3.20 gpm/ac =54 gpm (77,760 gallons per day (gpd) or 87.16 AFY)

- Maximum Demand = 54 gpm x 2. 7 = 145 gpm (208,800 gpd or 234 AFY)

JCSD has indicated that adequate water plant pumping capacity and water storage is available to service the Project. Based on the analysis provided above, adequate water supplies are anticipated to serve the project from existing entitlements and as such, no new or expanded entitlements are needed to meet the water demands of the proposed Project.

Mitigation

No mitigation is required.

6.17(e) Result in a determination by the wastewater treatment provider, which 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?

Finding: Less-than-Significant Impact

(Sources: Project Application Materials; JCSD Sewer Master Plan; JCSD Water and Sewer Availability Letter, 2014; Western Riverside County Regional Wastewater Authority (WRCRWA)

Treatment of wastewater collected by JCSD in the Project site's vicinity occurs at the Western Riverside County Regional Wastewater Treatment Plant (WRCRWTP). Sewer service is contingent upon the quantity and quality of wastewater generated by the Project. The WRCRWTP currently treats 8 million gallons per day (MGD) with a capability for expansion to 32 MGD. A $44 million expansion to increase the plant capacity to 13.25 MGD is underway and is in the design stage (WRCRWA, n.d.). JCSD has estimated that this Project would generate approximately 0.23 MGD of wastewater, based on a per unit factor of 180 GPD, which would comprise a small fraction of the treatment plant's existing daily capacity. With the next plant expansion and future expansions, it is anticipated that there will be adequate capacity to treat the incremental increase in waste water anticipated from the proposed Project. The Project's impact on the treatment plant capacity would be less than significant. Nonetheless, JCSD will need to verify that their existing allocation of treatment capacity can accommodate this Project; if not, this Project would have to purchase capacity in the treatment plant. While this does not involve a significant environmental effect, Mitigation Measure U-1 is recommended to ensure that the Project pays for additional JCSD allocation of regional wastewater treatment plant capacity, if needed, to handle the wastewater load generated by this Project.

Mitigation

> **Mitigation Measure U-1**: The Applicant shall work with JCSD to assure that the JCSD's allocation of wastewater treatment capacity in the WRCRWTP is sufficient to accommodate this Project's wastewater load. If it is insufficient, the Project shall pay for the required volume of treatment plant capacity, prior to issuance of any building permits.

6.17(f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

Finding: Less-than-Significant Impact

(Sources: United States Environmental Protection Agency (EPA), Estimating 2003 Building-Related Construction and Demolition Materials Amounts; Countywide Disposal Tonnage Tracking System Disposal Reports – 2nd Quarter 2014"; Cal Recycle Solid Waste Information System; Riverside County General Plan Program EIR, 2003, Chapter 4.15 – Public Services)

Construction and operation of the proposed Project would result in the generation of a variety of solid wastes, requiring disposal at a landfill. During the second quarter of 2014 (April 1, 2014 through June 30, 2014), which is the most recent time period for which reporting data is available, all solid waste generated within the City of Jurupa Valley was deposited at the Badlands Sanitary Landfill and the El Sobrante Landfill. Therefore, the analysis below evaluates the Project's potential to result in adverse impacts to these two landfill facilities.

The Badlands Sanitary Landfill has a permitted disposal capacity of 4,000 tons per day. The Badlands Sanitary Landfill is estimated to reach capacity, at the earliest time, in the year 2024; however, future landfill expansion opportunities exist at this site. During the second quarter of 2014, the Badlands Sanitary Landfill accepted approximately 222,357.27 tons of landfilled waste (approximately 2,443.4 tons per day), which corresponds to approximately 61% of its permitted daily disposal volume.

The El Sobrante Landfill is has a permitted disposal capacity of 16,054 tons per day. The El Sobrante Landfill is estimated to reach capacity, at the earliest time, in the year 2045; however, future landfill expansion opportunities exist at this site. During the second quarter of 2014, the El Sobrante Landfill accepted approximately 451,062.25 tons of landfilled waste (approximately 4,956.7 tons per day), which corresponds to approximately 31% of its permitted daily disposal volume.

❑ **Construction Impact Analysis**

Since there are no existing buildings or other structures or site improvements on the Project site, there would be no demolition or demolition-related wastes. There would be vegetation and some soil wastes generated during the site clearance/excavation activities that would be disposed of at local landfills, since these would not be appropriate materials for reuse in the preparation of the site for building pads, etc.

Waste also would be generated by the construction process, primarily consisting of discarded materials and packaging, along with wood and other materials wastes. Based on the proposed Project's total building square footage of 572,351 s.f,, including apartment buildings (565,396 s.f.), leasing/clubhouse (4,393 s.f.), and cabana (2,562 s.f.), and a construction waste generation factor of 4.39 pounds per s.f., approximately 1,256 tons of waste would be generated during the construction of the proposed Project. Additional waste would be expected from the construction of streets, common areas, infrastructure installation, and other Project-related construction activities.

Pursuant to Section 4.408 of the 2013 California Green Building Standards Code, at least 50% of the Project's construction wastes (excluding soil and land-clearing debris) must be recycled and/or salvaged for reuse, rather than transported for landfill disposal. Those wastes that are not diverted from landfills would be disposed at the Badlands Sanitary Landfill and/or the El Sobrante Landfill. These landfills receive well below their maximum permitted daily disposal volume and demolition and construction waste generated by the Project is not anticipated to cause these landfills to exceed their maximum permitted daily disposal volume. Furthermore, none of these regional landfill facilities are expected to reach their total maximum permitted disposal capacities during the Project's construction period. Because the Project would generate a relatively small amount of solid waste per day, as compared to the permitted daily capacities for Badlands Sanitary Landfill and the El Sobrante Landfill, these regional landfill facilities would have sufficient daily capacity to accept solid waste generated by the Project. Impacts would be less than significant.

- **Operational Impact Analysis**

Based on a waste generation factor of 0.41 tons per unit per year as documented in the Riverside County General Plan EIR, the Project's proposed 397 apartments would generate approximately 162.7 tons of waste per year, or 0.44 tons of waste per day.

Solid waste generated during long-term operation of the Project would be disposed at the Badlands Sanitary Landfill and/or the El Sobrante Landfill. During long-term operation, the Project's solid waste would represent approximately 0.003% of the daily permitted disposal capacity at the Badlands Sanitary Landfill and approximately 0.003% of the daily permitted disposal capacity at the El Sobrante Landfill. These landfills currently receive well below their maximum permitted daily disposal volume and, as noted earlier, they both have sufficient remaining capacity, with potential expansion areas, to remain open to accept wastes for decades to come. As such, solid waste generated by the Project is not anticipated to cause these landfills to exceed their maximum permitted daily disposal volume. Impacts would be less than significant.

Mitigation

No mitigation is required.

6.17(g) Comply with federal, state, and local statutes and regulations related to solid waste?

Finding: Less-than-Significant Impact

(Sources: California Assembly Bill 939; Riverside County Integrated Waste Management Plan, 1996)

The California Integrated Waste Management Act (Assembly Bill (AB) 939), signed into law in 1989, established an integrated waste management system that focused on source reduction, recycling, composting, and land disposal of waste. In addition, the bill established a 50% waste reduction requirement for cities and counties by the year 2000, along with a process to ensure environmentally safe disposal of waste that could not be diverted. Per the requirements of the Integrated Waste Management Act, the Riverside County Board of Supervisors adopted the Riverside Countywide Integrated Waste Management Plan (CIWMP), which outlines the goals,

policies, and programs the County and its cities will implement to create an integrated and cost effective waste management system that complies with the provisions of AB 939 and its diversion mandates.

Section 4.408 of the California Green Building Standards Code establishes a mandatory requirement to recycle and/or salvage for reuse a minimum of 50% of the non-hazardous construction waste created by a residential construction project (excluding soil and land-clearing debris). The Contractor must submit a construction waste management plan for City approval to define the methods of compliance and provide documentation of the satisfactory accomplishment of the waste diversion efforts. In order to assist the City of Jurupa Valley and the County of Riverside in achieving the mandated goals of the Integrated Waste Management Act, the apartment management company would be required to work with future refuse haulers to develop and implement feasible waste reduction programs, including source reduction, recycling, and composting. Additionally, in accordance with the California Solid Waste Reuse and Recycling Act of 1991 (Cal Pub Res. Code § 42911), the Project would provide adequate areas for collecting and loading recyclable materials where solid waste is collected. The collection areas are required to be shown on construction drawings and be in place before occupancy permits are issued. The implementation of these programs would reduce the amount of solid waste generated by the Project and diverted to landfills, which in turn would aid in the extension of the life of affected disposal sites. The Project would comply with all applicable solid waste statutes and regulations; as such, impacts would be less than significant.

Mitigation

Although impacts associated with compliance to federal, state, and local statutes and regulations related to solid waste would be less than significant, the following mitigation measures are recommended to ensure compliance with mandatory solid waste reduction requirements.

> **Mitigation Measure U-2:** The Project shall participate in established City-wide programs for residential development projects to reduce solid waste generation, in accordance with the provisions of the Riverside Countywide Integrated Waste Management Plan. Additionally, the Project shall comply with Section 4.408 of the 2013 California Green Building Code Standards, which requires new development projects to submit and implement a construction waste management plan in order to reduce the amount of construction waste transported to landfills. Prior to the issuance of building permits, the City of Jurupa Valley shall confirm that a sufficient plan has been submitted, and prior to final building inspections, the City of Jurupa shall review and verify the Contractor's documentation that confirms the volumes and types of wastes that were diverted from landfill disposal, in accordance with the approved construction waste management plan.
>
> **Mitigation Measure U-3:** The Project shall comply with the California Solid Waste Reuse and Recycling Act of 1991, which requires new development projects to prepare a waste recycling plan in order to reduce the amount of solid waste diverted to landfills. Prior to the issuance of grading and building permits, the Project Applicant shall submit a Waste Recycling Plan to the City of Jurupa Valley and the Riverside County Waste Management Department. The Waste Recycling Plan shall list the estimated quantity of waste to be

generated on-site during construction and demolition activities and the methods that will be utilized to recycle, reuse, compost and/or salvage a minimum of 50% of the construction and demolition waste generated on-site. Following the completion of construction activities, the Project Applicant shall submit a final Waste Recycling Report to the City of Jurupa Valley and the Riverside County Waste Management Department that demonstrates the actual quantities of construction and demolition waste generated and recycled.

Mitigation Measure U-4: The Project shall comply with the California Solid Waste Reuse and Recycling Act of 1991, which requires new development projects to provide refuse/recycling collection and loading areas in order to reduce the amount of solid waste transported to landfills. Prior to the issuance of building permits, the City of Jurupa Valley shall confirm that adequate areas for collecting and loading recyclable materials are identified on Project construction drawings.

6.18 MANDATORY FINDINGS OF SIGNIFICANCE

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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 wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal 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, which will cause substantial adverse effects on human beings, either directly or indirectly?		✓		

Impact Analysis

6.18(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 wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Finding: Less-than-Significant with Mitigation Incorporated

(Sources: Project Application Materials, this IS/MND)

All impacts to the environment, including impacts to habitat for fish and wildlife species, fish and wildlife populations, plant and animal communities, rare and endangered plants and animals, and historical and pre-historical resources were evaluated as part of this IS/MND. Throughout this IS/MND, where impacts were determined to be potentially significant, mitigation measures have been imposed to reduce those impacts to less-than-significant levels. Accordingly, with

incorporation of the mitigation measures imposed throughout this IS/MND, the Project would not substantially degrade the quality of the environment and impacts would be less than significant.

Mitigation

All mitigation measures specified in this IS/MND shall apply.

6.18(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)?

Finding: Less-than-Significant Impact with Mitigation Incorporated

(Sources: Project Application Materials; this IS/MND)

As discussed throughout this IS/MND, implementation of the proposed Project has the potential to result in effects to the environment that are individually limited, but cumulatively considerable, including impacts to Biological Resources and Transportation/Traffic. In all instances where the Project has the potential to contribute to a cumulatively considerable impact to the environment, mitigation measures have been imposed to reduce potential effects to less-than-significant levels. As such, with incorporation of the mitigation measures imposed throughout this IS/MND, the Project would not contribute to environmental effects that are individually limited, but cumulatively considerable, and impacts would be less than significant.

Mitigation

Mitigation Measures BR-1, BR-2, and TR-2 through TR-6 shall apply.

6.18(c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?

Finding: Less-than-Significant with Mitigation Incorporated

(Sources: Project Application Materials; this IS/MND)

The Project's potential to result in environmental effects that could adversely affect human beings, either directly or indirectly, has been discussed throughout this Environmental Checklist/Initial Study. In instances where the Project has potential to result in direct or indirect adverse effects to human beings, including impacts to Air Quality, Geology and Soils, and Noise, mitigation measures have been applied to reduce the impact to below a level of significance. With required implementation of mitigation measures identified in this IS/MND, construction and operation of the proposed Project would not involve any activities that would result in environmental effects which would cause substantial adverse effects on human beings, either directly or indirectly.

Mitigation

Mitigation measures AQ-1 though AQ-6, GE-1 through GE-5, and N-1 through N-4 shall apply.

7.0 References

7.0 REFERENCES

7.1 Documents and Websites Consulted

The following information sources were used during the preparation of this document:

Albert A. Webb Associates. *Project Specific Water Quality Management Plan (WQMP).* June, 17, 2014.

Ardery, 2014. E-mail from Jason Ardery, Director of Land Development Engineering, Albert A. Webb Associates. *Grading Quantities and Import or Export*. September 29, 2014.

Ardery, October 2014. E-mail from Jason Ardery, Director of Land Development Engineering, Albert A. Webb Associates. *Grading Quantities and Import or Export*. October, 2014.

Ardery, November 2014. E-mail from Jason Ardery, Director of Land Development Engineering, Albert A. Webb Associates. *Grading Quantities and Import or Export*. November, 2014.

CalRecycle. *Solid Waste Information System (SWIS)*. "Badlands Sanitary Landfill" Available: http://www.calrecycle.ca.gov/SWFacilities/Directory/33-AA-0006/Detail/ (Accessed November 26, 2014) and "El Sobrante Landfill" Available: http://www.calrecycle.ca.gov/SWFacilities/Directory/33-AA-0217/Detail/ (Accessed November 26, 2014).

CARB, 2008. California Air Resources Board (CARB). *Preliminary Draft Staff Proposal.* October 24, 2008. Available: http://www.arb.ca.gov/cc/localgov/ceqa/meetings/102708/prelimdraftproposal102408.pdf. Accessed November 26, 2014.

CDC, 2010. California Department of Conservation, Division of Land Resource Protection. *Farmland Mapping and Monitoring Program: Riverside County Important Farmland 2010*. Available: ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2010/riv10_west.pdf. Accessed November 25, 2014.

CDC, FY '08 - '09. California Department of Conservation, Division of Land Resource Protection. *Riverside County Williamson Act Map FY 08-09, Sheet 1 of 3*. Available: ftp://ftp.consrv.ca.gov/pub/dlrp/wa/riverside_w_08_09_WA.pdf. Accessed November 25, 2014.

California Department of Conservation. California Geological Survey. *SMARA Maps.* Available: http://www.quake.ca.gov/gmaps/WH/smaramaps.htm. Accessed November 26, 2014.

California Department of Transportation. n.d. *California Scenic Highway Program Eligible and Designated Routes*. Available: http://www.dot.ca.gov/hq/LandArch/scenic/cahisys.htm. Accessed November 25, 2014.

California State Legislature. 2004. Senate Bill 50 (Greene).

California State Legislature. 1989. Assembly Bill 939 (Sher).

Captain Andre Schmidt Eastvale Fire Station, 2014. *Confirmation that Project Site is within the Service Area of the Eastvale Fire Station*. Personal communication with Connie Anderson of T&B Planning, Inc. on October 14, 2014.

City of Jurupa Valley. *City of Jurupa Valley General Plan Land Use Map*. July 1, 2011. Available: http://jurupavalley.org/Portals/21/Documents/Departments/Planning/Area%20Maps/JurupaValleyGPjuly2011_map.pdf. Accessed November 26, 2014.

City of Jurupa Valley. *City of Jurupa Valley Zoning Map*. July 1, 2011. Available: http://jurupavalley.org/Portals/21/Documents/Departments/Planning/Area%20Maps/JurupaValleyZNjuly2011_map.pdf. Accessed November 26, 2014.

Federal Emergency Management Agency (FEMA). *Letter of Map Revision Determination Document Case No. 14-09-1024P, Effective October 20, 2014.* June 6, 2014.

Glenn Lukos Associates. 2014. *Biological Technical Report for Vernola Marketplace Apartments*. September 12, 2014.

Google. *Google Earth.* Vers. 6.1.0.5001. Computer Software. Google, 2011.

Institute of Transportation Engineers (ITE). *Trip Generation Manual, 9th Edition*. September 1, 2012.

JCSD, 2014. Jurupa Community Services District (JCSD). *Water and Sewer Availability Letter for Vernola Marketplace Apartments.* September 9, 2014.

Jurupa Community Services District (JCSD). *2010 Urban Water Management Plan.* May 2011. Available online at: http://www.jcsd.us/Portals/0/final_UWMP_051011_low_res_w_cover.pdf (Accessed November 26, 2014) and available for public review at JCSD, 11201 Harrel Street, Jurupa Valley, CA, 91752.

Jurupa Community Services District (JCSD). *Master Sewer Plan.* September 2004. Available: http://www.jcsd.us/Portals/0/JCSD%20MSP%202011.pdf. Accessed November 26, 2014.

LSA Associates, Inc. *Cultural Resources Assessment for the 17.38-Acre Phase A Vernola Marketplace Apartments Project.* July 2014.

LSA Associates, Inc. *Paleontological Resources Assessment for Vernola Marketplace Apartments: Phase A Project.* July 2014.

NorCal Engineering. *Geotechnical Engineering Investigation.* June 30, 2014.

PIC, August 2014. PIC Environmental Services. *Phase 1 Environmental Site Assessment Report*. August 12, 2014.

Project Application Materials (General Plan Amendment 1404, Zone Change 1405, Specific Plan Amendment 1401, Site Plan Development 31416) on file at the City of Jurupa Valley Planning Department (8304 Limonite Avenue, Suite "M," Jurupa Valley, California 92509).

Riverside County. *Eastvale Area Plan*. October 7, 2003. Available: http://planning.rctlma.org/Portals/0/genplan/content/ap1/eastvale.html. Accessed November 26, 2014.

Riverside County. *Jurupa Area Plan*. October 7, 2003. Available: http://planning.rctlma.org/Portals/0/genplan/content/ap1/jurupa.html. Accessed November 26, 2014.

Riverside County 2003a. *City of Jurupa Valley General Plan*. October 7, 2003. Available: http://planning.rctlma.org/ZoningInformation/GeneralPlan/RiversideCountyGeneralPlan2003/GeneralPlanSub2003.aspx. Accessed November 25, 2014.

Riverside County, 2003b. *Riverside County General Plan Program Environmental Impact Report (EIR)*. October 7, 2003. Available: http://planning.rctlma.org/Portals/0/genplan/content/eir/volume1.html and http://planning.rctlma.org/Portals/0/genplan/content/eir/volume2.html. Accessed November 26, 2014.

Riverside County. *Ordinance No. 461*. December 20, 2007. Available: http://rctlma.org/Portals/7/documents/ord461/ord461_package.pdf. Accessed November 26, 2014.

Riverside County. *Ordinance No. 625.* December 8, 1994. Available: http://www.rivcocob.org/ords/600/625.1.pdf. Accessed November 26, 2014.

Riverside County. *Ordinance No. 659.* November 1, 2012. Available: http://www.rivcocob.org/ords/600/659.11.pdf. Accessed November 26, 2014.

Riverside County. *Ordinance No. 847.* July, 19, 2007. Available: http://www.rivcocob.org/ords/800/847.pdf. Accessed November 26, 2014.

Riverside County. *Riverside County Airport Land Use Compatibility Plan*. October 14, 2004. Available: http://www.rcaluc.org/plan_new.asp. Accessed November 26, 2014.

Riverside County. *Western Riverside County Multiple Species Habitat Conservation Plan.* 2003. Available: http://www.wrc-rca.org/library.asp. Accessed November 26, 2014.

Riverside County Fire Department. "Fire Stations". n.d. Available: http://www.rvcfire.org/stationsandfunctions/firestations/Pages/default.aspx. Accessed November 26, 2014.

Riverside County Land Information System (RCLIS). Available: http://tlmabld5.agency.tlma.co.riverside.ca.us/website/rclis/. Accessed January 5, 2015

Riverside County Transportation Commission. *2011 Riverside County Congestion Management Program*. December 14, 2011. Available: http://www.rctc.org/uploads/media_items/congestionmanagementprogram.original.pdf. Accessed November 26, 2014.

Riverside County Waste Management Department. 2014. *Countywide Disposal Tonnage Tracking System Disposal Reports- 2nd Quarter 2014.* October 14, 2014. Available: http://www.rivcowm.org/opencms/ab939/pdf/DisposalReportsPDFs/2014-2QTR-RCDisposalReports.pdf. Accessed November 26, 2014.

Riverside County Waste Management District. *Riverside Countywide Integrated Waste Management Plan.* September 1996. Available: http://www.rivcowm.org/opencms/ab939/pdf/55402-Riverside-CIWMP-Final-Draft-Sept1996.pdf. Accessed November 26, 2014.

Santa Ana Regional Water Quality Control Board. *The Santa Ana River Basin Water Quality Control Plan*. February 2008. Available online at: http://www.waterboards.ca.gov/rwqcb8/water_issues/programs/basin_plan/index.shtml (Accessed November 26, 2014) and available for public review at the Santa Ana RWQCB office located at 3737 Main Street, Suite 500, Riverside, CA 92501.

Santa Ana Watershed Project Authority. 2014. *One Water, One Watershed (OWOW) Plan 2.0.* February 4, 2014. Available online at: http://www.sawpa.org/owow-2-0-plan-2/ (Accessed November 26, 2014) and available for public review at the Santa Ana RWQCB office located at 3737 Main Street, Suite 500, Riverside, CA 92501.

Site Field Survey, August 2014. Conducted by T&B Planning, Inc. staff.

South Coast Air Quality Management District (SCAQMD). *CEQA Air Quality Handbook*. April 1993, with November 1993 Update.

South Coast Air Quality Management District (SCAQMD). *SCAQMD Air Quality Significance Thresholds*. Available: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf?sfvrsn=2. Accessed November 26, 2014.

South Coast Air Quality Management District (SCAQMD). *Final 2012 Air Quality Management Plan.* February 2013. Available: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-

quality-management-plans/2012-air-quality-management-plan/final-2012-aqmp-(february-2013)/main-document-final-2012.pdf. Accessed November 26, 2014.

South Coast Air Quality Management District (SCAQMD). *Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES III)*. September 2008. Available: http://www.aqmd.gov/home/library/air-quality-data-studies/health-studies/mates-iii/mates-iii-final-report. Accessed November 26, 2014.

South Coast Air Quality Management District (SCAQMD). *"MATES III" Carcinogenic Risk Interactive Map.* Available: http://www3.aqmd.gov/webappl/matesiii/. Accessed November 26, 2014.

United States Environmental Protection Agency. 2009. *Estimating 2003 Building-Related Construction and Demolition Materials Amounts.* March 2009. Available: http://www.epa.gov/wastes/conserve/imr/cdm/pubs/cd-meas.pdf. Accessed November 26, 2014.

Urban Crossroads, 2014a. Urban Crossroads. *Air Quality Impact Analysis*. August 27, 2014.

Urban Crossroads, 2014b. Urban Crossroads. *Mobile Air Toxic and Criteria Pollutant Health Risk Assessment*. July 25, 2014.

Urban Crossroads, 2014c. Urban Crossroads. *Greenhouse Gas Analysis.* August 27, 2014.

Urban Crossroads, 2014d. Urban Crossroads. *Noise Impact Analysis*. November 21, 2014.

Urban Crossroads, 2014e. Urban Crossroads. *Traffic Impact Analysis.* December 15, 2014.

Webb Associates, 2014. Albert A. Webb Associates. *Drainage Study Report.* September 2014.

WRCRWA, n.d. Western Riverside County Regional Wastewater Authority (WRCRWA) Website. Available: http://www.wmwd.com/index.aspx?NID=186. Accessed November 26, 2014.

7.2 Initial Study Preparers

7.2.1 City of Jurupa Valley Planning Department

Tom Merrell, AICP, Planning Director
Laurie Lovret, AICP, Senior Planner
Ernest Perea, CEQA Administrator

7.2.2 T&B Planning, Inc.

Tracy Zinn, AICP, Principal
Randy Nichols, Senior Project Manager
Jerrica Harding, AICP, Senior Project Manager
Courtney Davis, Staff Planner

Eric Horowitz, Senior GIS/ Graphics Manager
Steve Lusk, GIS/Graphics Specialist

8.0 Mitigation Monitoring and Reporting Program

8.0 Mitigation Monitoring and Reporting Program

The Mitigation Monitoring and Reporting Program identifies the entities responsible for ensuring the timely and complete implementation of all mitigation measures imposed on the proposed Project to ensure that effects to the environment are reduced to less-than-significant levels. The table below presents findings for significant impacts that warrant mitigation measures along with impacts that were found to be less than significant but that have associated mitigation measures to ensure compliance with recommendations. The table below tracks all mitigation that is detailed in the IS/MND for the proposed Project.

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
Aesthetics					
Threshold 6.1(d): The Project would introduce new sources of artificial lighting to the property, which has the potential to adversely affect nighttime views in the area.	**Mitigation Measure AE-1:** Prior to residential building permit issuance, the City shall review construction drawings to ensure that proposed exterior, artificial lighting is in compliance with City of Jurupa Valley Design Guidelines, Section II.H, outdoor lighting, other than street lighting, shall be low to the ground or shielded and hooded to avoid shining onto adjacent properties and streets. Project contractors shall be required to comply with the construction drawings and permit periodic inspection of the construction site by City of Jurupa Valley staff or its designee to confirm compliance.	Project Applicant/Developer	City of Jurupa Valley Planning and Building & Safety Departments	Prior to issuance of a building permit	Less than Significant with Mitigation Incorporated
	Mitigation Measure AE-2: Street lights shall comply with design standards contained within City Ordinance No. 461 (Road Improvement Standards & Specifications) which specify that street luminaires shall be full cut off.	Project Applicant/Developer	City of Jurupa Valley; Engineering Department	Prior to approval of street improvement plans	

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
Air Quality					
Threshold 6.3(b): Although proposed temporary near-term construction activities would not exceed applicable SCAQMD regional thresholds for all criteria pollutants emissions, mitigation is recommended to ensure compliance with applicable SCAQMD rules and thresholds.	**Mitigation Measure AQ-1:** The Project is required to comply with the provisions of South Coast Air Quality Management District Rule 403, "Fugitive Dust." Rule 403 requires implementation of best available dust control measures during construction activities that generate fugitive dust, such as earth moving and stockpiling activities, grading, and equipment travel on unpaved roads. Prior to grading permit issuance, the City shall verify that the following notes are included on grading plans and/or stockpile plans. Project contractors shall be required to ensure compliance with the notes and permit periodic inspection of the construction site by City of Jurupa Valley staff or its designee to confirm compliance. These notes also shall be specified in bid documents issued to prospective construction contractors. a. During grading and ground-disturbing construction activities, the construction contractor shall ensure that all clearing, grading, or excavation activities shall cease when winds exceed 25 miles per hour (mph). b. During grading and ground-disturbing construction activities, the construction contractor shall ensure that all unpaved roads and areas within the Project undergoing active ground disturbance are watered at least three (3) times daily during dry weather. Watering, with complete coverage of disturbed areas by water truck, sprinkler system or other comparable means, shall occur in the mid-morning, afternoon, and after work has been completed for the day. c. Temporary signs shall be installed on the construction site along all unpaved roads indicating a maximum speed limit of 15 miles per hour (mph). The signs shall be installed before construction activities commence and remain in place during the	Project Applicant/Developer/ Construction Manager	City of Jurupa Valley, Building & Safety department	Prior to the issuance of grading and stockpile permits	Less than Significant

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	duration of vehicle activities on all unpaved roads and haul routes.				
	Mitigation Measure AQ-2: The Project is required to comply with California Code of Regulations Title 13, Division 3, Chapter 10, Article 1, Section 2485, "Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling." Prior to grading permit issuance and building permit issuance, the City shall verify that the following notes are included on the grading and building plans. Project contractors shall be required to ensure compliance with the notes and permit periodic inspection of the construction site by City of Jurupa Valley staff or its designee to confirm compliance. These notes also shall be specified in bid documents issued to prospective construction contractors. a. Temporary signs shall be placed on the construction site at all construction vehicle entry points and at all loading, unloading, and equipment staging areas indicating that heavy duty trucks are prohibited from idling for more than five (5) minutes at any location. The signs shall be installed before construction activities commence and remain in place during the duration of construction activities at all loading, unloading, and equipment staging areas.	Project Applicant/Developer/ Construction Manager	City of Jurupa Valley Building & Safety Department	Prior to the issuance of grading and building permits	
	Mitigation Measure AQ-3: Prior to grading permit issuance, the City shall verify that the following note is included on the grading plan. Project contractors shall be required to ensure compliance with the note and permit periodic inspection of the construction site by City of Jurupa Valley staff or its designee to confirm compliance. The note also shall be specified in bid documents issued to prospective construction contractors. a. The construction contractor shall ensure that heavy duty construction equipment activities (i.e., crawlers, graders, bulldozers, and scrapers) do not	Project Applicant/Developer/ Construction Manager	City of Jurupa Valley Building & Safety Department	Prior to the issuance of a grading permit	

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	cause more than 4.0 acres of active ground disturbance per day. The construction contractor shall maintain a written log or map of daily mass grading activities, which shall be available for City of Jurupa Valley inspection upon request				
Threshold 6.3(d): The Project would not expose sensitive receptors in the vicinity of the Project site to substantial concentrations of particulate matter during temporary near-term construction activities. Although the Project would not expose on-site residents to substantial toxic air pollutant concentrations during long-term operation, due in part to the installation of an air filtration system in every residential home, mitigation is recommended to ensure that this design feature is installed and properly maintained.	**Mitigation Measure AQ-4:** Prior to every residential building permit final inspection, the City shall verify that an operating air filtration system has been installed in every apartment. The air filtration system shall have a documented efficiency level equal to or exceeding a Minimum Efficiency Reporting Value (MERV) 16 as defined by the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Standard 52.2. As a condition of occupancy permits, the apartment complex owner/operator/rental management company shall be required to maintain the air filtration systems in good operating condition according to the manufacturer's specifications. **Mitigation Measure AQ-5:** The following note shall be specified in each apartment's lease agreement and an operation and maintenance manual for the air filtration system shall be required in all lease agreements notifying renters of their responsibility to operate and maintain the air infiltration system. The Project's rental management company shall enforce the lease agreement. a. An air filtration system has been installed in each apartment unit that achieves a documented efficiency level equal to or exceeding a Minimum Efficiency Reporting Value (MERV) 16 as defined by the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Standard 52.2. Operation and maintenance of the air filtration system is required to reduce interior air pollutant levels to within South Coast air Quality Management District	Project Applicant/Developer Project Applicant/Developer/ Lease Manager	City of Jurupa Valley Building & Safety Department City of Jurupa Valley Planning Department	Prior to final building inspections for each apartment building Prior to the first building permit final inspection	Less than Significant

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	standards. It is the responsibility of the apartment occupants to promptly report any and all maintenance issues associated with the air filtration system to the rental management company.				
Threshold 6.3(e): Although Project-related odor impacts would be less than significant, the following mitigation measure is recommended to ensure compliance with SCAQMD Rule 402.	**Mitigation Measure AQ-6:** The Project is required to comply with the provisions of South Coast Air Quality Management District Rule 402 "Nuisance." Adherence to Rule 402 reduces the release of odorous emissions into the atmosphere. Prior to grading and building permit issuance, the City shall verify that the following note is included on the grading and building plans. Project contractors shall be required to ensure compliance with the notes and permit periodic inspection of the construction site by City of Jurupa Valley staff or its designee to confirm compliance. The note shall be specified in bid documents issued to prospective construction contractors. a. There shall be no discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.	Project Applicant/Developer/ Construction Manager	City of Jurupa Valley Planning Department and Building & Safety Department	Prior to issuance of grading and building permits, prior to first building permit final inspection	Less than Significant
Biological Resources					
Threshold 6.4(a): Although no nesting migratory birds and/or burrowing owls were observed on the Project site, there is the potential that these species could occupy the site prior to the commencement of construction activities and thus be impacted by such activities.	**Mitigation Measure BR-1:** Within 30 days prior to grading, a qualified biologist shall conduct a survey of the Project's proposed impact footprint and make a determination regarding the presence or absence of the burrowing owl. The determination shall be documented in a report and shall be submitted, reviewed, and accepted by the City of Jurupa Valley Planning Department prior to the issuance of a	Project Biologist	City of Jurupa Valley Planning Department and Building & Safety Department	Prior to the issuance of a grading permit and within 30 days prior to grading	Less than Significant with Mitigation Incorporated

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	grading permit and subject to the following provisions: a. In the event that the pre-construction survey identifies no burrowing owls in the impact area, a grading permit may be issued without restriction. b. In the event that the pre-construction survey identifies the presence of at least one individual but less than three (3) mating pairs of burrowing owl, then prior to the issuance of a grading permit and prior to the commencement of ground-disturbing activities on the property, the qualified biologist shall passively or actively relocate any burrowing owls. Passive relocation, including the required use of one-way doors to exclude owls from the site and the collapsing of burrows, will occur if the biologist determines that the proximity and availability of alternate habitat is suitable for successful passive relocation. Passive relocation shall follow CDFW relocation protocol and shall only occur between September 15 and February 1. If proximate alternate habitat is not present as determined by the biologist, active relocation shall follow CDFW relocation protocol. The biologist shall confirm in writing that the species has fledged the site or been relocated prior to the issuance of a grading permit. c. In the event that the pre-construction survey identifies the presence of three (3) or more mating pairs of burrowing owl, the requirements of MSCHP Species-Specific Conservation Objectives 5 for the burrowing owl shall be followed. Objective 5 states that if the site (including adjacent areas) supports three (3) or more pairs of burrowing owls and supports greater than 35 acres of suitable Habitat, at least 90 percent of the area with long-term conservation value and burrowing owl pairs will be conserved onsite until it is demonstrated that MSHCP Species-Specific Conservation Objectives 1-4 have				

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	been met. Objectives 1-4 are listed in the MSHCP, Volume I, Appendix E. A grading permit shall only be issued, either: i. upon approval and implementation of a property-specific Determination of Biologically Superior Preservation (DBESP) report for the western burrowing owl by the CDFW; or ii. a determination by the biologist that the site is part of an area supporting less than 35 acres of suitable habitat, and upon passive or active relocation of the species following accepted CDFW protocols.				
	Mitigation Measure BR-2: As a condition of approval for all grading permits, vegetation clearing and ground disturbance shall be prohibited during the migratory bird nesting season (February 1 through September 15), unless a migratory bird nesting survey is completed in accordance with the following requirements: a. A migratory nesting bird survey of the Project's impact footprint shall be conducted by a qualified biologist within three (3) days prior to initiating vegetation clearing or ground disturbance. b. A copy of the migratory nesting bird survey results report shall be provided to the City of Jurupa Planning Department. If the survey identifies the presence of active nests, then the qualified biologist shall provide the Planning Department with a copy of maps showing the location of all nests and an appropriate buffer zone around each nest sufficient to protect the nest from direct and indirect impact. The size and location of all buffer zones, if required, shall be subject to review and approval by the Planning Department and shall be no less than a 200-foot radius around the nest for non-raptors and a 500-foot radius around the nest for raptors. The nests and buffer zones shall be field checked weekly by a	Project Biologist	City of Jurupa Valley Planning Department and Building & Safety Department	Prior to the issuance of a grading permit and within 30 days prior to grading	Less than Significant with Mitigation Incorporated

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	qualified biological monitor. The approved buffer zone shall be marked in the field with construction fencing, within which no vegetation clearing or ground disturbance shall commence until the qualified biologist and Planning Department verify that the nests are no longer occupied and the juvenile birds can survive independently from the nests.				
Threshold 6.4(f): Although no nesting migratory birds and/or burrowing owls were observed on the Project site, there is the potential that these species could occupy the site prior to the commencement of construction activities and thus be impacted by such activities.	Mitigation BR-1 shall apply.	Project Biologist	City of Jurupa Valley Planning Department and Building & Safety Department	Prior to issuance of a grading permit and within 30 days of grading activity	Less than Significant with Mitigation Incorporated
Cultural Resources					
Threshold 6.5(b): The Project has the potential to uncover and affect previously unknown archaeological resources during construction activities.	**Mitigation Measure CR-1:** Prior to the issuance of a grading permit, the Project Proponent shall provide evidence to the City that a qualified professional archaeological monitor has been retained by the Project Applicant to conduct monitoring of all mass grading and trenching activities in previously undisturbed soils and has the authority to halt and redirect earthmoving activities in the event that suspected archaeological resources are unearthed during Project construction.	Project Applicant/Developer/ Archaeologist	City of Jurupa Valley Planning Department and Building & Safety Department	Prior to issuance of a grading permit and during grading, where warranted	Less than Significant with Mitigation Incorporated
	Mitigation Measure CR-2: Prior to the issuance of a grading permit, the Project Proponent shall provide evidence to the City that appropriate Native American representative(s) shall be allowed to monitor and have received or will receive a minimum of 15 days advance notice of mass grading activities in previously undisturbed soils. During grading operations in previously undisturbed soils, a professional archaeological monitor shall observe the grading	Project Applicant/Developer/ Archaeologist	City of Jurupa Valley Planning Department and Building & Safety Department	Prior to issuance of a grading permit and during grading, where warranted	

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	operation until such time as the monitor determines that there is no longer any potential to uncover buried cultural deposits. If the monitor suspects that an archaeological resource may have been unearthed, the monitor shall immediately halt and redirect grading operations in a 100-foot radius around the find to allow identification and evaluation of the suspected resource. If the monitor determines that the suspected resource is potentially significant, the archaeologist shall notify the appropriate Native American Tribe(s) and invite a tribal representative to consult on the resource evaluation. In consultation with the appropriate Native American Tribe(s), the archaeological monitor shall evaluate the suspected resource and make a determination of significance pursuant to California Public Resources Code Section 21083.2. If the resource is significant, Mitigation Measure CR-3 shall apply. **Mitigation Measure CR-3:** If a significant archaeological resource(s) is discovered on the property, ground disturbing activities shall be suspended 100 feet around the resource(s). The archaeological monitor and a representative of the appropriate Native American Tribe(s), the Project Proponent, and the City Planning Department shall confer regarding mitigation of the discovered resource(s). A treatment plan shall be prepared and implemented by the archaeologist to protect the identified archaeological resource(s) from damage and destruction. The treatment plan shall contain a research design and data recovery program necessary document the size and content of the discovery such that the resource(s) can be evaluated for significance under CEQA criteria. The research design shall list the sampling procedures appropriate to exhaust the research potential of the archaeological resource(s) in accordance with current professional archaeology	Project Applicant/Developer/ Archaeologist	City of Jurupa Valley Planning Department and Building & Safety Department	Concurrent with grading activities.	

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	standards (typically this sampling level is two (2) to five (5) percent of the volume of the cultural deposit). The treatment plan shall require monitoring by the appropriate Native American Tribe(s) during data recovery excavations of archaeological resource(s) of prehistoric origin, and shall require that all recovered artifacts undergo laboratory analysis. At the completion of the laboratory analysis, any recovered archaeological resources shall be processed and curated according to current professional repository standards. The collections and associated records shall be donated to an appropriate curation facility, or, the artifacts may be delivered to the appropriate Native American Tribe(s) if that is recommended by the City of Jurupa Valley. A final report containing the significance and treatment findings shall be prepared by the archaeologist and submitted to the City of Jurupa Valley Planning Department and the Eastern Information Center.				
Threshold 6.5(c): The Project has the potential to uncover and affect previously unknown paleontological resources during construction activities.	**Mitigation Measure CR-4:** Prior to the issuance of grading permits, the Project Proponent shall provide a letter of verification to the City of Jurupa Valley stating that a qualified paleontologist has been retained to develop a Paleontological Resources Impact Mitigation Plan (PRIMP). The PRIMP shall include the methods that will be used to protect paleontological resources that may exist within the Project site, as well as procedures for monitoring, fossil preparation and identification, curation of specimens into an accredited repository, and preparation of a report at the conclusion of the monitoring program to be submitted to the City of Jurupa Valley. **Mitigation Measure CR-5:** During excavation and grading activities in deposits with a high paleontological sensitivity rating (identified on Figure 3, Paleontological Sensitivity Map, of the Project's Paleontological Resources Assessment, as Young	Project Applicant/Developer/ Paleontologist Project Applicant/Developer/ Paleontologist	City of Jurupa Valley, Planning Department, Building & Safety Department City of Jurupa Valley, Planning Department, Building & Safety Department	Prior to issuance of a grading permit and during grading, where warranted Prior to issuance of a grading permit and during grading, where warranted	Less than Significant with Mitigation Incorporated

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	Alluvial Channel Deposits below a depth of 5 feet from the surface, Old Alluvial Channel Deposits, and Very Old Alluvial Channel Deposits) shall be monitored on a full-time basis by a qualified paleontological monitor following the Paleontological Resources Impact Mitigation Plan (PRIMP).				
	Mitigation Measure CR-6: Excavation and grading activities in deposits with low paleontological sensitivity (identified on Figure 3, Paleontological Sensitivity Map, of the Project's Paleontological Resources Assessment, as Young Alluvial Channel Deposits from the surface to a depth of 5 feet) shall be monitored by a qualified paleontological monitor on a spot-check basis.	Project Applicant/Developer/ Paleontologist	City of Jurupa Valley, Planning Department, Building & Safety Department	Prior to issuance of a grading permit and during grading, where warranted	
	Mitigation Measure CR-7: If paleontological resources are encountered during the course of ground disturbance activities, the paleontological monitor shall have the authority to temporarily redirect construction away from the area of the find in order to assess its scientific significance. Collected resources shall be prepared to the point of identification, identified to the lowest taxonomic level possible, catalogued, and curated into the permanent collections of an accredited scientific institution. At the conclusion of the monitoring program, a report of findings shall be prepared to document the results of the monitoring program.	Project Applicant/Developer/ Paleontologist	City of Jurupa Valley, Planning Department, Building & Safety Department	Prior to issuance of a grading permit and during grading, where warranted	
	Mitigation Measure CR-8: In the event that paleontological resources are encountered when a paleontological monitor is not present, work in the immediate area of the find shall be redirected and a paleontologist shall be contacted to assess the find for scientific significance. In addition, if the find is located in sediments with a low paleontological sensitivity	Project Applicant/Developer/ Paleontologist	City of Jurupa Valley, Planning Department, Building & Safety Department	Prior to issuance of a grading permit and during grading, where warranted	

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	rating (Young Alluvial Channel Deposits from the surface to a depth of 5 feet), the paleontologist shall make recommendations as to whether monitoring shall be required in these sediments on a full-time basis.				
Threshold 6.5(d): Although impacts to human remains would be less than significant, mitigation is recommended to ensure compliance with California Health and Safety Code Section 7050.5 and California Public Resources Code Section 5097.98(b).	**Mitigation Measure CR-9:** Prior to grading permit issuance, the City shall verify that the following note is included on the grading plan. Project contractors shall be required to ensure compliance with the note. This note also shall be specified in bid documents issued to prospective construction contractors. a. If human remains are encountered, California Health and Safety Code Section 7050.5 requires that no further disturbance occur until the Riverside County Coroner has made the necessary findings as to origin. Further, pursuant to California Public Resources Code Section 5097.98(b), remains shall be left in place and free from disturbance until a final decision as to the treatment and disposition has been made by the Coroner. If the Riverside County Coroner determines the remains to be Native American, the California Native American Heritage Commission must be contacted within 24 hours. The Native American Heritage Commission must then immediately notify the "most likely descendant(s)" of receiving notification of the discovery. The most likely descendant(s) shall then make recommendations within 48 hours, and engage in consultations concerning the treatment of the remains as provided in Public Resources Code Section 5097.98.	Project Applicant/Developer/ Construction Manager	City of Jurupa Valley Planning Department and Building & Safety Department	Prior to issuance of a grading permit and during grading, if warranted	Less than Significant
Geology and Soils					
Threshold 6.6(a)(2): Although impacts associated with seismic shaking would be less than significant, mitigation is	**Mitigation Measure GE-1:** Prior to grading and building permit issuance, the City shall verify that the following note is included on grading and building plans. Project contractors shall be required to ensure	Project Applicant/Developer/ Construction Manager	City of Jurupa Valley Building & Safety Department	Prior to issuance of grading and building permits, concurrent with grading and construction	Less than Significant

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
recommended to ensure compliance with the California Code of Regulations, Title 24.	compliance with the note. This note also shall be specified in bid documents issued to prospective construction contractors. a. Construction activities shall occur in accordance with all applicable requirements of the California Code of Regulations (CCR), Title 24 (also known as the California Building Code Standards Code (CBSC) in effect at the time of construction.			activities	
Threshold 6.6(a)(3): The Project contains soils that are subject to liquefaction and could expose people or structures to substantial adverse effects associated with soil failure.	**Mitigation Measure GE-2:** Prior to the issuance of grading and building permits, a licensed geotechnical engineer contracted to the City or the Project Proponent shall review the detailed construction plans and make a written determination of concurrence with the recommendations specified in the Project's Geotechnical Investigation on file with the City associated with Master Case 1485. The written determination shall be filed with the City of Jurupa Valley. The City shall verify that all of the recommendations given in the Project's Geotechnical Engineering Investigation and written determination are incorporated into the grading and building specifications, including but not limited to all disturbed top soils and surficial and stockpiled fill (about 1 to 18 feet below existing ground surface) shall be removed to competent native material, the exposed surface scarified to a depth of 12 inches, brought to within 2 percent of optimum moisture content and compacted to a minimum of 90% of the laboratory standard (ASTM: D-1557) prior to placement of any additional compacted fill soils, foundations, slabs-on-grade and pavement. In areas of transition between the underlying native material and engineered fill, additional overexcavation of the native material consisting of a depth of two (2) feet below proposed foundations is required to mitigate for differential settlement. This fill shall extend a minimum of five (5) horizontal feet or to a depth of vertical excavation, whichever is greater, beyond the	Project Geotechnical Engineer	City of Jurupa Valley Building & Safety Department	Prior to issuance of grading and building permits	Less than Significant with Mitigation Incorporated

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	outside edge of the perimeter foundation.				
Threshold 6.6(b): Although impacts associated with soil erosion would be less than significant, mitigation is recommended to ensure compliance with regulatory permitting requirements.	**Mitigation Measure GE-3:** Prior to grading permit issuance, the Project Proponent shall obtain a National Pollutant Discharge Elimination System (NPDES) permit from the State Water Resources Control Board. Evidence that an NPDES permit has been issued shall be provided to the City of Jurupa Valley prior to issuance of the first grading permit.	Project Applicant/Developer/ Construction Manager	City of Jurupa Valley Building & Safety Department	Prior to issuance of a grading permit	Less than Significant
	Mitigation Measure GE-4: Prior to grading permit issuance, the Project Proponent shall prepare a Stormwater Pollution Prevention Plan (SWPPP). Project contractors shall be required to ensure compliance with the SWPPP and permit periodic inspection of the construction site by City of Jurupa Valley staff or its designee to confirm compliance.	Project Applicant/Developer/ Construction Manager	City of Jurupa Valley Building & Safety Department	Prior to issuance of a grading permit and concurrent with grading activities	
	Mitigation Measure GE-5: Project contractors shall be required to ensure compliance with the Project's Water Quality Management Plan (WQMP) associated with Master Case 1485 and permit periodic inspection of the construction site by City of Jurupa Valley staff or its designee to confirm compliance.	Project Applicant/Developer/ Construction Manager	City of Jurupa Valley Building & Safety Department	Prior to issuance of a grading permit and concurrent with grading activities	
Threshold 6.6(c): The Project contains soils that could be subject to liquefaction and could expose people or structures to substantial adverse effects associated with soil failure.	**Mitigation Measure GE-6:** Prior to the issuance of grading and building permits, a licensed geotechnical engineer contracted to the City or the Project Proponent shall review the detailed construction plans and sections and make a written determination of concurrence with the recommendations specified in the Project's Geotechnical Reports associated with Master Case 1485. The written determination shall be filed with the City of Jurupa Valley. The City shall verify that all of the recommendations given in the Project's Geotechnical Reports and written determination are incorporated into the grading and building specifications, including but not limited to the recommendation to remove near surface soils down to competent materials and replace those soils with properly compacted fill to limit the potential for soil	Project Applicant/Developer	City of Jurupa Valley Building & Safety Department	Prior to issuance of a grading permit	Less than Significant with Mitigation Incorporated

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	subsidence and collapse. Mitigation Measure GE-1 shall also apply.				
Threshold 6.6(d): The Project site contains expansive soils.	Mitigation Measure GE-6 shall apply.	Project Applicant/Developer	City of Jurupa Valley Building & Safety Department	Prior to issuance of a grading permit	Less than Significant with Mitigation
Greenhouse Gas Emissions					
Threshold 6.7(b): Although impacts associated with greenhouse gas emissions would be less than significant, mitigation is recommended to ensure compliance with regulatory permitting requirements.	**Mitigation Measure GG-1:** Prior to building permit issuance, the City shall verify that the following note is included on building plans. Project contractors shall be required to ensure compliance with the note and permit inspection by City of Jurupa Valley staff or its designee to ensure compliance. The note also shall be specified in bid documents issued to prospective construction contractors. a. All installed appliances shall comply with California Code of Regulations Title 20 (Appliance Energy Efficiency Standards), which establishes energy efficiency requirements for appliances.	Project Applicant/Developer	City of Jurupa Valley Building & Safety Department	Prior to building permit issuance	Less than Significant
	Mitigation Measure GG-2: Prior to the approval of landscaping plans, the City shall verify that the all landscaping will comply with City Ordinance No. 859, "Water Efficient Landscape Requirements." Project contractors shall be required to ensure compliance with approved landscaping plans.	Project Applicant/Developer	City of Jurupa Valley Building & Safety Department	Prior to building permit issuance	
	Mitigation Measure GG-3: Prior to issuance of the first building permit, the Project Applicant shall submit energy usage calculations in the form of a Title 24 Compliance Report to the City of Jurupa Valley Planning Department showing that the Project will be constructed to achieve the building energy efficiency standards set forth in California Code of Regulations Title 24 requirements in effect at the time of building permit issuance. Prior to issuance of the first building permit, the City shall review and approve the Report. Any combination of design features may be used to	Project Applicant/Developer	City of Jurupa Valley Building & Safety Department	Prior to issuance of first building permit	

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	fulfill this mitigation measure, including but not limited to, the following: a. Increasing insulation such that heat transfer and thermal bridging is minimized; b. Limiting air leakage through the structure and/or within the heating and cooling distribution system; c. Using energy-efficient space heating and cooling equipment; d. Installing dual-paned or other energy-efficient windows; e. Using interior or exterior energy-efficient lighting; f. Installing automatic devices to turn off lights where they are not needed; g. Applying paint and a surface color palette that emphasizes light and off-white colors that reflect heat away from buildings; h. Designing buildings with "cool roofs" using products certified by the Cool Roof Rating Council, and/or exposed roof surfaces using light and off-white colors; i. Designing buildings to accommodate photo-voltaic solar electricity systems or installation of photo-voltaic solar electricity systems; j. Installing Energy Star-rated appliances.				
Hydrology and Water Quality					
Threshold 6.9(a): Significant water quality impacts during construction activities would be avoided through preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) and compliance with the terms of a General Construction	**Mitigation Measure H-1**: During grading and ground-disturbing activities, the construction contractor shall ensure that the offsite export area is contour graded between the northern property line and the RCFCD storm drain easement in a manner which would perpetuate the existing drainage pattern. The construction contractor shall ensure that slopes	Project Applicant/Developer/ Construction Manager	City of Jurupa Valley Building and Safety Department	During placement of soil export on adjacent site	Less than significant

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
Permit, issued by the Santa Ana Regional Water Quality Management Board. Mitigation measure H-1 is recommended to ensure adequate erosion control is provided in the SWPPP for the adjacent off-site soil export area.	are graded at or less than 3:1, and permanent erosion measures (the use of soil binders, and/or hydroseeding with native plants and vegetation) be implemented as soon as possible following placement of the exported soils on the adjacent offsite export area.				
Land Use and Planning					
Threshold 6.10(c): Although no nesting migratory birds and/or burrowing owls were observed on the Project site, there is the potential that these species could occupy the site prior to the commencement of construction activities and thus be impacted by such activities.	Mitigation BR-1 shall apply.	Project Biologist	City of Jurupa Valley Planning Department and Building & Safety Department	Prior to the issuance of a grading permit and within 30 days prior to grading	Less than Significant with Mitigation Incorporated
Noise					
Threshold 6.12(a): The Project would have the potential to expose persons to noise levels in excess of local standards during long-term operation. Although temporary, near-term noise effects during construction would be less than significant, mitigation is recommended to ensure compliance with local noise standards and regulations.	**Mitigation Measure N-1:** Prior to grading and building permit issuance, the City shall verify that the following notes are included on grading plans and building plans. Project contractors shall be required to ensure compliance with the notes and permit periodic inspection of the construction site by City of Jurupa Valley staff or its designee to confirm compliance. These notes also shall be specified in bid documents issued to prospective construction contractors. a) All construction activities shall comply with City Ordinance No. 847 (Noise Ordinance). b) Construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. c) All stationary construction equipment shall be placed in such a manner so that emitted noise is	Project Applicant/Developer/ Construction Manager	City of Jurupa Valley Building & Safety Department	Prior to issuance of grading and building permits	Less than Significant with Mitigation Incorporated

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	directed away from the construction site's southern and eastern Project boundaries. d) Construction equipment staging areas shall be located in areas of the property that would create the greatest distance between construction-related noise sources and noise sensitive receivers nearest the Project site's southern and eastern boundaries.				
	Mitigation Measure N-2: Prior to issuance of any building permits for buildings adjacent to I-15 (Building 1 and Buildings 21 to 25), a minimum effective 12 foot high barrier shall be constructed on the western boundary of the Project site adjacent to I-15. Recommended barrier locations and other noise mitigation measures are shown on Figure 6-2, Noise Mitigation.	Project Applicant/Developer/ Construction Manager	City of Jurupa Valley Building & Safety Department	Prior to issuance of building permits for buildings adjacent to I-15	
	Mitigation N-3: Prior to issuance of building permits, a final noise study based on final precise grading plan elevations shall be prepared by a qualified acoustician and approved by the City to validate appropriate noise barrier heights, locations, and construction materials. All required noise barriers shall be designed to reduce noise levels to below 65 dBA CNEL within outdoor living areas. The noise barrier shall provide a weight of at least 4 pounds per square foot of face area with no decorative cutouts or line-of-sight openings between shielded areas and the roadways. The noise barriers may consist of masonry block, stucco veneer over wood framing (or foam core), or 1 inch thick tongue and groove wood of sufficient weight per square foot, ¼ inch thick glass or other transparent material with sufficient weight per square foot, earthen berm, or any combination of these materials that achieves the required noise attenuation and shall have no decorative cutouts or other line-of-sight openings between shielded areas and the noise source (adjacent roadway). Prior to issuance of building	Project Applicant/Developer	City of Jurupa Valley Building & Safety Department	Prior to issuance of building permits	

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	permits, the City of Jurupa Valley shall review and approve the noise barrier design, placement, and materials to ensure that the required level of sound attenuation will be achieved. **Mitigation Measure N-4:** Prior to issuance of any residential buildings permit, an interior noise analysis shall be completed to the satisfaction of the City Planning Department demonstrating that the proposed building materials will achieve interior noise levels less than 45 dBA CNEL. Building materials that would facilitate compliance with the 45 dBA CNEL interior noise standard, include, but are not limited to dual-glazed windows and a means of "windows closed" mechanical ventilation (e.g. air conditioning).	Project Applicant/Developer	City of Jurupa Valley Planning Department	Prior to issuance of building permits	
Threshold 6.12(d): Although temporary, near-term noise effects during construction would be less than significant, mitigation is recommended to ensure compliance with local noise standards and regulations.	Mitigation Measure N-1 shall apply.	Refer to MM N-1	Refer to MM N-1	Refer to MM N-1	Less than Significant with Mitigation Incorporated
Public Services					
Threshold 6.14(a): Although the Project would not cause the need to build new or physically altered fire, sheriff, or other public facilities, and impacts to public schools and parks would be less than significant, mitigation is recommended to ensure compliance with local ordinances and State law relating to impact fees required for the provision of public services.	**Mitigation Measure PS-1:** The Project shall comply with City's Development Impact Fee (DIF) Ordinance, which requires payment of a development mitigation fee to assist in providing revenue that the City can use to improve public facilities and/or equipment, to offset the incremental increase in the demand for public services that would be created by the Project. Prior to the issuance of building permits, the Project Applicant shall pay fees in accordance with the City's Ordinance 659.	Project Applicant/ Developer	City of Jurupa Valley Planning Department, City of Jurupa Valley Building and Safety Department	Prior to the issuance of building permits	Less than Significant

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	Mitigation Measure PS-2: The Project shall comply with the Leroy F. Greene School Facilities Act of 1998 (Senate Bill 50), which requires payment of a school impact fee on a per dwelling unit basis to assist in providing revenue that school districts (including CNUSD) can use to ensure the adequate provision of public education facilities and services to service new development. Prior to the issuance of building permits, the Project Applicant shall pay required impact fees to the CNUSD following CNUSD protocol for impact fee collection.	Project Applicant/ Developer	City of Jurupa Valley Planning Department, City of Jurupa Valley Building and Safety Department	Prior to the issuance of building permits	
	Mitigation Measure PS-3: The Project shall comply with JARPD Ordinance No. 02-2007, which requires payment of a development impact fee on a per dwelling unit basis to assist in providing revenue that JARPD can use to ensure the adequate provision of public parkland to service new development. Prior to the issuance of building permits, the Project Applicant shall pay required impact fees to the JARPD, following JARPD protocol for impact fee collection.	Project Applicant/ Developer	City of Jurupa Valley Planning Department, City of Jurupa Valley Building and Safety Department	Prior to the issuance of building permits	
Transportation/Traffic					
Threshold 6.16(a): The Project would result in less-than-significant effects to the local circulation system during temporary construction activities; however, mitigation is proposed to minimize impacts on local traffic flows and potential nuisance impacts to neighboring land uses. Implementation of the proposed Project has the potential to directly cause and cumulatively contribute to level of service deficiencies in the local circulation system in near-term	**Mitigation Measure TR-1**: Prior to issuance of grading permits and building permits, a construction traffic management plan shall be submitted for approval by the City's Building Official. This plan shall identify route restrictions, hourly restrictions, locations of staging and storage areas, locations of work crew parking, etc., to minimize impacts during morning and afternoon peak commute periods and to prohibit routing of truck traffic through any neighboring residential areas.	Project Applicant/ Developer, Project Construction Manager	City of Jurupa Valley Building and Safety Department	Prior to issuance of grading and building permits	Less than Significant with Mitigation

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
(Opening Year) and long-term (Horizon Year) conditions.					
	Mitigation Measure TR-2: Prior to the issuance of the Project's first building permit, the Project Proponent shall pay to the City of Jurupa Valley a fair share contribution to assure the construction of the geometric improvements specified in the Project conditions of approval at the intersection of Pats Ranch Road/68th Street.	Project Applicant/ Developer	City of Jurupa Valley Planning Department	Prior to the issuance of a building permit	
	Mitigation Measure TR-3: Prior to the issuance of the Project's first building permit, the Project Proponent shall pay fees required by the Riverside County TUMF and RBBD programs to assure the construction of the geometric improvements specified in the Project conditions of approval to the intersection of I-15 Southbound Ramps/Limonite Avenue.	Project Applicant/ Developer	City of Jurupa Valley Planning Department	Prior to the issuance of a building permit	
	Mitigation Measure TR-4: Prior to the issuance of the Project's first building permit, the Project Proponent shall pay fees required by Riverside County TUMF and RBBD programs to assure the construction of the geometric improvements specified in the Project conditions of approval to the intersection of I-15 Northbound Ramps/Limonite Avenue.	Project Applicant/ Developer	City of Jurupa Valley Planning Department	Prior to the issuance of a building permit	
	Mitigation Measure TR-5: Prior to the issuance of the Project's first occupancy permit, the Project Proponent shall pay fees required by the Riverside County TUMF program and its fair share contribution toward improvements not programmed by TUMF to assure the construction of the geometric improvements specified in the Project conditions of approval to the intersection of Pats Ranch Road/Limonite Avenue.	Project Applicant/ Developer	City of Jurupa Valley Planning Department	Prior to the first building permit final inspection	

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
	Mitigation Measure TR-6: Prior to the issuance of the Project's first occupancy permit, the Project Proponent shall pay fees required by the Riverside County TUMF program and its fair share contribution toward improvements not programmed by TUMF to assure the construction of the geometric improvements specified in the Project conditions of approval to the intersection of Wineville Avenue/Limonite Avenue.	Project Applicant/ Developer	City of Jurupa Valley Planning Department	Prior to the first building permit final inspection	
Threshold 6.16(b): The Project would result and contribute to a level of service deficiency to the Riverside County Congestion Management Program circulation system in near-term (Opening Year) and long-term (Horizon Year) conditions.	Mitigation Measures TR-3 through TR-4 shall apply	Refer to MM TR-3 through MM TR-4	Refer to MM TR-2 through MM TR-4	Refer to MM TR-2 through MM TR-4	Less than Significant with Mitigation Incorporated

Impact	Mitigation Measure (MM)	Responsible Party	Monitoring Party	Implementation Stage	Level of Significance
Utility and Service Systems					
Threshold 6.17(e): Although Project impacts on the capacity of the regional wastewater treatment plant would be less than significant, Mitigation Measure U-1 is recommended to ensure that the Project pays for an additional allocation of capacity for JCSD, if needed, to handle the Project's wastewater load.	**Mitigation Measure U-1**: The Applicant shall work with JCSD to assure that the JCSD's allocation of wastewater treatment capacity in the WRCRWTP is sufficient to accommodate this Project's wastewater load. If it is insufficient, the Project shall pay for the required volume of treatment plant capacity, prior to issuance of any building permits.	Project Applicant/Developer	City of Jurupa Valley Building & Safety Department	Prior to issuance of first building permit	Less than significant
Threshold 6.17(g): Although impacts associated with compliance to federal, state, and local statutes and regulations related to solid waste would be less than significant, mitigation is recommended to ensure compliance with mandatory solid waste reduction requirements.	**Mitigation Measure U-2:** The Project shall participate in established City-wide programs for residential development projects to reduce solid waste generation, in accordance with the provisions of the Riverside Countywide Integrated Waste Management Plan. Additionally, the Project shall comply with Section 4.408 of the 2013 California Green Building Code Standards, which requires new development projects to submit and implement a construction waste management plan in order to reduce the amount of construction waste transported to landfills. Prior to the issuance of building permits, the City of Jurupa Valley shall confirm that a sufficient plan has been submitted, and prior to final building inspections, the City of Jurupa shall review and verify the Contractor's documentation that confirms the volumes and types of wastes that were diverted from landfill disposal, in accordance with the approved construction waste management plan.	Project Applicant/ Developer	City of Jurupa Valley Planning Department, City of Jurupa Valley Building and Safety Department	Prior to the issuance of the first building permit final inspection	Less than Significant

	Mitigation Measure U-3: The Project shall comply with the California Solid Waste Reuse and Recycling Act of 1991, which requires new development projects to prepare a waste recycling plan in order to reduce the amount of solid waste diverted to landfills. Prior to the issuance of grading and building permits, the Project Applicant shall submit a Waste Recycling Plan to the City of Jurupa Valley and the Riverside County Waste Management Department. The Waste Recycling Plan shall list the estimated quantity of waste to be generated on-site during construction and demolition activities and the methods that will be utilized to recycle, reuse, compost and/or salvage a minimum of 50% of the construction and demolition waste generated on-site. Following the completion of construction activities, the Project Applicant shall submit a final Waste Recycling Report to the City of Jurupa Valley and the Riverside County Waste Management Department that demonstrates the actual quantities of construction and demolition waste generated and recycled.	Project Applicant/ Developer	City of Jurupa Valley Planning Department, City of Jurupa Valley Building and Safety Department	Prior to the issuance of a grading permit	
	Mitigation Measure U-4: The Project shall comply with the California Solid Waste Reuse and Recycling Act of 1991, which requires new development projects to provide refuse/recycling collection and loading areas in order to reduce the amount of solid waste transported to landfills. Prior to the issuance of building permits, the City of Jurupa Valley shall confirm that adequate areas for collecting and loading recyclable materials are identified on Project construction drawings.	Project Applicant/ Developer	City of Jurupa Valley Building and Safety Department	Prior to the issuance of building permits	

VERNOLA MARKETPLACE APARTMENTS

Technical Appendix I
Traffic Impact Analysis

URBAN CROSSROADS

Vernola Marketplace Apartments

TRAFFIC IMPACT ANALYSIS

CITY OF JURUPA VALLEY

PREPARED BY:

Aric Evatt, PTP
aevatt@urbanxroads.com
(949) 660-1994 x204

Charlene So, PE
cso@urbanxroads.com
(949) 660-1994 x222

Donson Liu, EIT
dliu@urbanxroads.com
(949) 660-1994 x248

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
DIF	Development Impact Fee
E+P	Existing Plus Project
FHWA	Federal Highway Administration
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
MUTCD	Manual on Uniform Traffic Control Devices
NCHRP	National Cooperative Highway Research Program
NP	No Project (or Without Project)
PCE	Passenger Car Equivalents
PHF	Peak Hour Factor
Project	Vernola Marketplace Apartments
RBBD	Road and Bridge Benefit District
RCCDR	Riverside County Center for Demographic Research
RCTC	Riverside County Transportation Commission
RivTAM	Riverside County Transportation Analysis Model
SHS	State Highway System
TIA	Traffic Impact Analysis
tsf	Thousand Square Feet
TUMF	Transportation Uniform Mitigation Fee
WP	With Project
WRCOG	Western Riverside Council of Governments

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1 INTRODUCTION

This report presents the results of the traffic impact analysis (TIA) for the proposed Vernola Marketplace Apartments ("Project") located at the northwest corner of Pats Ranch Road and 68th Street in the City of Jurupa Valley as shown on Exhibit 1-1.

The purpose of this traffic impact analysis is to evaluate the potential circulation system deficiencies that may result from the development of the proposed Project, and to recommend improvements to achieve acceptable circulation system operations. The City of Jurupa Valley does not have their own traffic study guidelines; as such, the City defers to the County's traffic study guidelines. This TIA has been prepared in accordance with the County of Riverside Traffic Impact Analysis Preparation Guide (August 2008). (1)

1.1 PROJECT OVERVIEW

The Project is proposed to consist of the development of 397 apartment units. For the purposes of this analysis, it is assumed that the Project will be constructed within a single development phase. The Project is anticipated to be fully built and occupied by Year 2016.

The Project is proposed to have access on Pats Ranch Road, with right-in/right-out access only at Driveway 1 and full-access (i.e., no restricted turning movements) at Driveway 2. Driveway 2 is proposed to align with the existing Ivory Street on Pats Ranch Road. Regional access to the project site is provided via the I-15 Freeway and Limonite Avenue interchange.

Trips generated by the Project's proposed land uses have been estimated based on trip generation rates collected by the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 9th Edition, 2012. (2) The Project is estimated to generate a net total of 2,640 trip-ends per day on a typical weekday with approximately 202 AM peak hour trips and 246 PM peak hour trips. The assumptions and methods used to estimate the Project's trip generation characteristics are discussed in greater detail in Section 4.1 *Project Trip Generation* of this report.

1.2 ANALYSIS SCENARIOS

For the purposes of this traffic study, potential impacts to traffic and circulation have been assessed for each of the following conditions:

- Existing (2014) (1 scenario)
- Existing plus Project (1 scenario)
- Existing plus Ambient Growth plus Project (2016) (1 scenario)
- Existing plus Ambient Growth plus Project plus Cumulative (2016) (1 scenario)
- Horizon Year (2035), Without and With Project (2 scenarios)

EXHIBIT 1-1: PRELIMINARY SITE PLAN

LEGEND:

FULL = FULL ACCESS
RIRO = RIGHT-IN / RIGHT-OUT

1.2.1 Existing (2014) Conditions

Information for Existing (2014) conditions is disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared.

1.2.2 Existing Plus Project (E+P) Conditions

The E+P analysis determines circulation system deficiencies that would occur on the existing roadway system in the scenario of the Project being placed upon Existing conditions.

1.2.3 Existing Plus Ambient Growth Plus Project (EAP) Conditions

The EAP (2016) conditions analysis determines potential traffic impacts based on a comparison of the EAP traffic conditions to Existing conditions. To account for background traffic growth, an ambient growth factor from Existing conditions of 4.04% (2 percent per year over 2 years, compounded annually) are included for EAP traffic conditions. The analysis for EAP traffic conditions includes traffic generated by the proposed Project. Other cumulative development projects are not included as part of the EAP analysis. Consistent with Riverside County traffic study guidelines, the EAP analysis is intended to identify "Opening Year" impacts associated with the development of the proposed Project based on the expected background growth within the study area.

1.2.4 Existing Plus Ambient Growth Plus Project Plus Cumulative (EAPC) Conditions

The EAPC (2016) conditions analysis determines the potential near-term cumulative circulation system deficiencies. To account for background traffic growth, traffic associated with other known cumulative development projects in conjunction with an ambient growth from Existing conditions of 4.04% (2 percent per year over 2 years, compounded annually) is included for EAPC (2016) traffic conditions. This comprehensive list was compiled from information provided by the City of Jurupa Valley, City of Eastvale, County of Riverside, City of Ontario, City of Chino, City of Corona, and City of Norco and is consistent with recent studies in the study area.

1.2.5 Horizon Year (2035) Conditions

Traffic projections for Horizon Year (2035) With Project conditions were derived from the Riverside County Transportation Analysis Model (RivTAM) using accepted procedures for model forecast refinement and smoothing.

The Horizon Year Without and With Project traffic conditions analyses will be utilized to determine if improvements funded through regional transportation mitigation fee programs, such as the City of Jurupa Valley Development Impact Fee (DIF) program, County of Riverside Transportation Uniform Mitigation Fee (TUMF) program, Mira Loma Road and Bridge Benefit District (RBBD), or other approved funding mechanism can accommodate the long-range cumulative traffic at the target level of service (LOS) identified in the City of Jurupa Valley General Plan. If the "funded" improvements can provide the target LOS, then the Project's payment into these existing fee programs shall be considered as cumulative mitigation through the conditions of approval.

1.3 STUDY AREA

To ensure that this TIA satisfies the City of Jurupa Valley's traffic study requirements, Urban Crossroads, Inc. prepared a project traffic study scoping package for review by City staff prior to the preparation of this report. The Agreement provides an outline of the Project study area, trip generation, trip distribution, and analysis methodology. The Agreement approved by the City is included in Appendix "1.1".

The following 9 study area intersections shown on Exhibit 1-2 and listed in Table 1-1 were selected for this TIA based on the City's guidelines that require analysis of intersection locations in which the proposed Project is anticipated to contribute 50 or more peak hour trips. Although the Project is not anticipated to contribute 50 or more peak hour trips to the intersection of Wineville Avenue and Limonite Avenue, the intersection has been included as a study area intersection and evaluated at the City's request.

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction
1	Hamner Avenue / 68th Street (*)	Eastvale
2	I-15 Southbound Ramps / Limonite Avenue	Caltrans
3	I-15 Northbound Ramps / Limonite Avenue	Caltrans
4	Pats Ranch Road / Limonite Avenue	Jurupa Valley
5	Pats Ranch Road / 65th Street (*)	Jurupa Valley
6	Pats Ranch Road / Driveway 1 – Future Intersection (*)	Jurupa Valley
7	Pats Ranch Road / Ivory Street (*)	Jurupa Valley
8	Pats Ranch Road / 68th Street (*)	Jurupa Valley
9	Wineville Avenue / Limonite Avenue	Jurupa Valley

* = Intersection also evaluated during the mid-day peak hour.

All of the study area intersections have been evaluated during the weekday AM and PM peak hours; however, as noted in Table 1-1, some intersections were also evaluated during the weekday mid-day peak hour to determine the operational effects of the near-by elementary school to these study area intersections.

1.4 ANALYSIS FINDINGS

This section provides a summary of the analysis results for Existing, E+P, EAP, EAPC, and Horizon Year traffic conditions.

A summary of intersection level of service (LOS) findings by traffic condition is provided on Table 1-2.

Existing (2014) Conditions

For Existing traffic conditions, the following intersection was found to operate at an unacceptable LOS during one or more of the peak hours:

EXHIBIT 1-2: LOCATION MAP

LEGEND:

- ⓪ = EXISTING INTERSECTION ANALYSIS LOCATION
- ⓪ = FUTURE INTERSECTION ANALYSIS LOCATION

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URBAN CROSSROADS

Table 1-2

Summary of Intersection Level of Service

#	Intersection	Existing LOS			E+P LOS			EAP (2016) LOS			EAPC (2016) LOS			HY (2035) Without Project LOS			HY (2035) With Project LOS			Acceptable LOS
		AM	Mid	PM	AM	Mid	PM	AM	Mid	PM	AM	Mid	PM	AM	Mid	PM	AM	Mid	PM	
1	Hamner Av. / 68th St.	D	C	C	D	C	C	D	C	C	D	D	C	D	D	D	D	D	D	D
2	I-15 SB Ramps / Limonite Av.	C	N/A	C	C	N/A	C	C	N/A	D	**E**	N/A	**F**	**F**	N/A	**F**	**F**	N/A	**F**	D
3	I-15 NB Ramps / Limonite Av.	C	N/A	D	C	N/A	D	C	N/A	D	**E**	N/A	**E**	D	N/A	**F**	**E**	N/A	**F**	D
4	Pats Ranch Rd. / Limonite Av.	B	N/A	B	B	N/A	B	B	N/A	B	C	N/A	D	**F**	N/A	**F**	**F**	N/A	**F**	D
5	Pats Ranch Rd. / 65th St.	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	D	B	C	D
6	Pats Ranch Rd. / Driveway 1	--	--	--	A	A	A	A	A	A	A	B	B	--	--	--	A	B	B	D
7	Pats Ranch Rd. / Ivory St.	C	C	B	C	C	B	C	C	B	C	D	C	D	D	C	D	D	D	D
8	Pats Ranch Rd. / 68th St.	**E**	C	B	**F**	D	B	**F**	D	C	**F**	**E**	C	**F**	**F**	**F**	**F**	**F**	**F**	D
9	Wineville Av. / Limonite Av.	C	N/A	C	C	N/A	C	C	N/A	C	C	N/A	D	**E**	N/A	**F**	**E**	N/A	**F**	D

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

N/A = Not applicable. Intersection not evaluated during the mid-day peak hour.

ID	Intersection Location
8	Pats Ranch Road / 68th Street – LOS "E" AM peak hour only

E+P Conditions

The same intersection that was found to operate at a deficient LOS under Existing traffic conditions was also found to operate at a deficient LOS under E+P traffic conditions. In other words, there were no NEW significant traffic impacts identified due to the addition of Project traffic. Improvements needed to address E+P traffic conditions were the same as those identified for Existing traffic conditions.

EAP Conditions

Based on a comparison of EAP to Existing traffic conditions, the same intersection previously identified to operate at an unacceptable LOS for Existing and E+P traffic conditions was also found to operate at an unacceptable LOS for EAP (2016) traffic conditions. Similar to E+P traffic conditions, the improvements needed to address EAP traffic conditions were the same as those identified for Existing traffic conditions.

EAPC Conditions

Based on the assessment of EAPC (2016) traffic conditions, the following additional intersections were identified to operate at a deficient LOS in addition to those previously identified under Existing, E+P, and EAP traffic conditions:

ID	Intersection Location
2	I-15 Southbound Ramps / Limonite Avenue – LOS "E" AM peak hour; LOS "F" PM peak hour
3	I-15 Northbound Ramps / Limonite Avenue – LOS "E" AM and PM peak hours

Horizon Year (2035) Conditions

Based on the assessment of Horizon Year Without Project and With Project traffic conditions, the following additional intersections were identified to operate at a deficient LOS in addition to those previously identified under EAPC traffic conditions:

ID	Intersection Location
4	Pats Ranch Road / Limonite Avenue – LOS "F" AM and PM peak hours
9	Wineville Avenue / Limonite Avenue – LOS "F" AM and PM peak hours

1.5 RECOMMENDED IMPROVEMENTS

Table 1-3 lists the recommended improvements necessary to reduce the identified intersection LOS deficiencies by traffic condition. In addition, Table 1-3 also indicates those improvements currently included in either the City of Jurupa Valley DIF, County of Riverside TUMF, or Mira Loma RBBD fee programs. In instances where improvement needs are not covered by DIF, TUMF or RBBD, the Project's "fair share" percentage has been calculated.

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Table 1-3
Table 1 of 2

Summary of Intersection Improvements

#	Intersection Location	Jurisdiction	Recommended Improvements[1]						Improvements in DIF,TUMF or RBBD[2]?	Fair Share %[3]
			Existing (2014)	E+P	EAP (2016)	EAPC (2016)	HY (2035) Without Project	HY (2035) With Project		
2	I-15 SB Ramps / Limonite Av.	Caltrans				3rd EB through lane	Same	Same	Yes (TUMF,RBBD)	--
						3rd WB through lane	Same	Same	Yes (TUMF,RBBD)	
							Modify the interchange by vacating WB left turn lanes and provide for an WB loop on ramp	Same	Yes (TUMF,RBBD)	
							2nd SB right turn lane	Same	Yes (TUMF,RBBD)	
3	I-15 NB Ramps / Limonite Av.	Caltrans				3rd EB through lane	Same	Same	Yes (TUMF,RBBD)	--
						3rd WB through lane	Same	Same	Yes (TUMF,RBBD)	
							Modify the interchange by vacating EB left turn lanes and provide for an EB loop on ramp	same	Yes (TUMF,RBBD)	
							2nd NB right turn lane	Same	Yes (TUMF,RBBD)	
4	Pats Ranch Rd. / Limonite Av.	Jurupa Valley			Lengthen the WBL to provide 250-feet of storage	Same	Same	Same	No	3.6%
						3rd EB through lane	Same	Same	Yes (TUMF)	
						3rd WB through lane	Same	Same	Yes (TUMF)	
							2nd WB left turn lane	Same	No	
							Modify the traffic signal to accommodate overlap phasing for the NB and EB right turn lanes	Same	No	

Table 1-3
Table 2 of 2

Summary of Intersection Improvements

#	Intersection Location	Jurisdiction	Recommended Improvements[1]						Improvements in DIF,TUMF or RBBD[2]?	Fair Share %[3]
			Existing (2014)	E+P	EAP (2016)	EAPC (2016)	HY (2035) Without Project	HY (2035) With Project		
8	Pats Ranch Rd. / 68th St.	Jurupa Valley	Traffic Signal	Same	Same	Same	Same	Same	No	4.1%
			Modify the traffic signal to accommodate overlap phasing for the SB right turn lane	Same	Same	Same	Same	Same	No	
						NB left turn lane	Same	Same	No	
						NB shared through-right turn lane	Same	Same	No	
						SB through lane	Same	Same	No	
						2nd EB through lane	Same	Same	No	
						WB left turn lane	Same	Same	No	
9	Wineville Av. / Limonite Av.	Jurupa Valley			Lengthen the WBL to provide 300-feet of storage	Same	Same	Same	No	1.1%
							2nd SB through lane	Same	No	
							SB right turn lane with overlap phasing	Same	No	
							2nd EB left turn lane	Same	No	
							3rd EB through lane	Same	Yes (TUMF)	
							2nd WB left turn lane	Same	No	
							3rd WB through lane	Same	Yes (TUMF)	

[1] All recommended improvements are consistent with the general plan designations of the respective jurisdictions in which they are located.

[2] Improvements are identified as being included in the Western Riverside Council of Governments (WRCOG) Transportation Uniform Mitigation Fee (TUMF) program or County of Riverside's Mira Loma Road and Bridge Benefit District (RBBD) Facilities List.

[3] Program improvements constructed by project may be eligible for fee credit, at discretion of City. See Table 10-2 for Fair Share Calculations.

1.6 ON-SITE ROADWAY AND SITE ACCESS IMPROVEMENTS

The Project is proposed to have access on Pats Ranch Road, with right-in/right-out access only at Driveway 1 and full-access (i.e., no restricted turning movements) at Driveway 2. Driveway 2 is proposed to align with the existing Ivory Street on Pats Ranch Road. Regional access to the project site is provided via the I-15 Freeway and Limonite Avenue interchange. Roadway improvements necessary to provide site access and on-site circulation are assumed to be constructed in conjunction with site development and are described below. These improvements should be in place prior to the issuance of the first Certificate of Occupancy.

1.6.1 SITE ADJACENT ROADWAY IMPROVEMENTS

The recommended site-adjacent roadway improvements for the Project are described below. These improvements need to be incorporated into the project description prior to Project approval or imposed as conditions of approval as part of the Project approval. Exhibit 1-3 illustrates the site-adjacent roadway improvement recommendations.

Pats Ranch Road – Pats Ranch Road is a north-south oriented roadway located along the Project's eastern boundary. Pats Ranch Road is not a General Plan roadway, however, it is currently constructed to its ultimate roadway width as a higher classification, four-lane divided roadway. The only roadway improvements necessary along Pats Ranch Road are striping needs at the site access points.

68th Street – 68th Street is an east-west oriented roadway located along the Project's southern boundary. Construct 68th Street along the Project's frontage to Pats Ranch Road at its ultimate half-section width as a Major Highway (118-foot right-of-way) in compliance with applicable City of Jurupa Valley standards.

Wherever necessary, roadways adjacent to the Project, site access points and site-adjacent intersections will be constructed to be consistent with the identified roadway classifications and respective cross-sections in the City of Jurupa Valley General Plan Circulation Element.

1.6.2 SITE ACCESS IMPROVEMENTS

The recommended site access driveway improvements for the Project are described below. Exhibit 1-3 also illustrates the on-site and site adjacent recommended roadway lane improvements. Construction of on-site and site adjacent improvements are recommended to be constructed and should be in place prior to the issuance of the first Certificate of Occupancy.

Pats Ranch Road at Driveway 1 – Install a stop control on the eastbound approach and construct the intersection as a right-in/right-out only driveway with the following geometrics:

Northbound Approach: Two through lanes.
Southbound Approach: One through lane and one shared through-right turn lane.
Eastbound Approach: One right turn lane.
Westbound Approach: N/A

EXHIBIT 1-3: SITE ACCESS AND SITE ADJACENT ROADWAY RECOMMENDATIONS

PATS RANCH ROAD IS A NORTH-SOUTH ORIENTED ROADWAY LOCATED ALONG THE PROJECT'S EASTERN BOUNDARY. PATS RANCH ROAD IS NOT A GENERAL PLAN ROADWAY, HOWEVER, IT IS CURRENTLY CONSTRUCTED TO ITS ULTIMATE ROADWAY WIDTH AS A HIGHER CLASSIFICATION, FOUR-LANE DIVIDED ROADWAY. THE ONLY ROADWAY IMPROVEMENTS NECESSARY ALONG PATS RANCH ROAD ARE STRIPING NEEDS AT THE SITE ACCESS POINTS.

ON-SITE TRAFFIC SIGNING AND STRIPING SHOULD BE IMPLEMENTED IN CONJUNCTION WITH DETAILED CONSTRUCTION PLANS FOR THE PROJECT SITE.

SIGHT DISTANCE AT EACH PROJECT ACCESS POINT SHOULD BE REVIEWED WITH RESPECT TO STANDARD CALTRANS AND CITY OF JURUPA VALLEY SIGHT DISTANCE STANDARDS AT THE TIME OF PREPARATION OF FINAL GRADING, LANDSCAPE AND STREET IMPROVEMENT PLANS.

68TH STREET IS AN EAST-WEST ORIENTED ROADWAY LOCATED ALONG THE PROJECT'S SOUTHERN BOUNDARY. CONSTRUCT 68TH STREET ALONG THE PROJECT'S FRONTAGE TO PATS RANCH ROAD AT ITS ULTIMATE HALF-SECTION WIDTH AS A MAJOR HIGHWAY (118-FOOT RIGHT-OF-WAY) IN COMPLIANCE WITH APPLICABLE CITY OF JURUPA VALLEY STANDARDS.

LEGEND:

= MAJOR ARTERIAL

Pats Ranch Road at Ivory Street – This driveway is proposed to align with existing Ivory Street on the east side of Pats Ranch Road. Install a stop control on the eastbound approach and construct the intersection with the following geometrics:

Northbound Approach: One left turn lane, one through lane, and one shared through-right turn lane.
Southbound Approach: One left turn lane, one through lane, and one shared through-right turn lane.
Eastbound Approach: One shared left-through-right turn lane.
Westbound Approach: One shared left-through-right turn lane.

Pats Ranch Road at 68th Street – This intersection is proposed to align with the proposed driveway for the future development on the south side of 68th Street (Riverbend project). Project should contribute its fair share towards the installation of a traffic signal at the intersection and the construction of the following geometrics:

Northbound Approach: N/A
Southbound Approach: One left turn lane and one right turn lane with overlap phasing.
Eastbound Approach: One left turn lane and one through lane.
Westbound Approach: Two through lanes and one right turn lane.

Pats Ranch Road is proposed to extend to the south to provide access to the future Riverbend project. As such, a westbound left turn lane will be added as part of the Riverbend project to provide site access.

On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the Project site.

Sight distance at each project access point should be reviewed with respect to standard Caltrans and City of Jurupa Valley sight distance standards at the time of preparation of final grading, landscape and street improvement plans.

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2 METHODOLOGIES

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report. The methodologies described are generally consistent with City of Jurupa Valley traffic study guidelines. (1) (3)

2.1 LEVEL OF SERVICE

Traffic operations of roadway facilities are described using the term "Level of Service" (LOS). LOS is a qualitative description of traffic flow based on several factors such as speed, travel time, delay, and freedom to maneuver. Six levels are typically defined ranging from LOS A, representing completely free-flow conditions, to LOS F, representing breakdown in flow resulting in stop-and-go conditions. LOS E represents operations at or near capacity, an unstable level where vehicles are operating with the minimum spacing for maintaining uniform flow.

2.2 INTERSECTION CAPACITY ANALYSIS

The definitions of LOS for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control. The LOS is typically dependent on the quality of traffic flow at the intersections along a roadway. The *Highway Capacity Manual* (HCM) methodology expresses the LOS at an intersection in terms of delay time for the various intersection approaches. (4) The HCM uses different procedures depending on the type of intersection control.

2.2.1 SIGNALIZED INTERSECTIONS

City of Jurupa Valley and City of Eastvale

The City of Jurupa Valley and City of Eastvale require signalized intersection operations analysis based on the methodology described in Chapter 18 and Chapter 31 of the HCM 2010. (4) Intersection LOS operations are based on an intersection's average control delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections LOS is directly related to the average control delay per vehicle and is correlated to a LOS designation as described in Table 2-1.

TABLE 2-1: SIGNALIZED INTERSECTION LOS THRESHOLDS

Description	Average Control Delay (Seconds), V/C ≤ 1.0	Level of Service, V/C ≤ 1.0	Level of Service, V/C > 1.0
Operations with very low delay occurring with favorable progression and/or short cycle length.	0 to 10.00	A	F
Operations with low delay occurring with good progression and/or short cycle lengths.	10.01 to 20.00	B	F
Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.01 to 35.00	C	F

Description	Average Control Delay (Seconds), V/C ≤ 1.0	Level of Service, V/C ≤ 1.0	Level of Service, V/C > 1.0
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.	35.01 to 55.00	D	F
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.	55.01 to 80.00	E	F
Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	80.01 and up	F	F

Source: HCM 2010, Chapter 18

Study area intersections have been analyzed using the software package Synchro (Version 8.0, Build 805). The LOS analysis for signalized intersections has been performed using optimized signal timing for existing traffic conditions. Signal timing optimization has considered pedestrian safety and signal coordination requirements. Appropriate time for pedestrian crossings has also been considered in the signalized intersection analysis. Signal timing for study area intersections have been requested and utilized. Where signal timing was unavailable, the local accepted standards were utilized in lieu of actual signal timing.

The peak hour traffic volumes have been adjusted using a peak hour factor (PHF) to reflect peak 15 minute volumes. Common practice for LOS analysis is to use a peak 15-minute rate of flow. However, flow rates are typically expressed in vehicles per hour. The PHF is the relationship between the peak 15-minute flow rate and the full hourly volume (e.g. PHF = [Hourly Volume] / [4 x Peak 15-minute Flow Rate]). The use of a 15-minute PHF produces a more detailed analysis as compared to analyzing vehicles per hour. Existing PHFs have been used for all analysis scenarios, with the exception of Horizon Year traffic conditions. Per Chapter 4 of the HCM 2010, PHF values over 0.95 often are indicative of high traffic volumes with capacity constraints on peak hour flows while lower PHF values are indicative of greater variability of flow during the peak hour. (4) In an effort to conduct a conservative analysis, a PHF of 0.92 has been utilized for Horizon Year traffic conditions for the intersections along Hamner Avenue and Limonite Avenue only unless the PHF is higher for Existing conditions.

California Department of Transportation (Caltrans)

Per the Caltrans *Guide for the Preparation of Traffic Impact Studies*, the traffic modeling and signal timing optimization software package Synchro (Version 8, Build 805) has also been utilized to analyze signalized intersections under Caltrans' jurisdiction, which include interchange to arterial ramps (i.e. I-15 Freeway ramps at Limonite Avenue). (3) Synchro is a macroscopic traffic software program that is based on the signalized intersection capacity analysis as specified in the Chapter 16 of the HCM. Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections. Equations are used to determine measures of effectiveness such as delay and queue length. The level of service and capacity analysis performed by Synchro takes into consideration

optimization and coordination of signalized intersections within a network. Signal timing for the freeway arterial-to-ramp intersections have been obtained from Caltrans District 8 and were utilized for the purposes of this analysis.

2.2.2 UNSIGNALIZED INTERSECTIONS

The City of Jurupa Valley and City of Eastvale require the operations of unsignalized intersections be evaluated using the methodology described in Chapter 19, Chapter 20, and Chapter 32 of the HCM 2010. (4) The LOS rating is based on the weighted average control delay expressed in seconds per vehicle (see Table 2-2).

TABLE 2-2: UNSIGNALIZED INTERSECTION LOS THRESHOLDS

Description	Average Control Delay Per Vehicle (Seconds)	Level of Service, V/C ≤ 1.0	Level of Service, V/C > 1.0
Little or no delays.	0 to 10.00	A	F
Short traffic delays.	10.01 to 15.00	B	F
Average traffic delays.	15.01 to 25.00	C	F
Long traffic delays.	25.01 to 35.00	D	F
Very long traffic delays.	35.01 to 50.00	E	F
Extreme traffic delays with intersection capacity exceeded.	> 50.00	F	F

Source: HCM 2010, Chapter 19 and Chapter 20

At two-way or side-street stop-controlled intersections, LOS is calculated for each controlled movement and for the left turn movement from the major street, as well as for the intersection as a whole. For approaches composed of a single lane, the delay is computed as the average of all movements in that lane. For all-way stop controlled intersections, LOS is computed for the intersection as a whole.

2.3 FREEWAY OFF-RAMP QUEUING ANALYSIS

The study area for this TIA includes the freeway-to-arterial interchanges of the I-15 Freeway at Limonite Avenue ramps. Consistent with Caltrans requirements, the 95th percentile queuing of vehicles has been assessed at the off-ramps to determine potential queuing impacts at the freeway ramp intersections on Archibald Avenue and Limonite Avenue. Specifically, the queuing analysis is utilized to identify any potential queuing and "spill back" onto the I-15 Freeway mainline from the off-ramps.

The City of Jurupa Valley has also requested that a progression analysis be performed during the peak hours for both EAP (2016) and EAPC (2016) traffic conditions along Limonite Avenue between the I-15 Freeway and Wineville Avenue. The progression of vehicles has been evaluated to determine potential peak hour queues along Limonite Avenue between the I-15 Freeway and Wineville Avenue.

The traffic modeling and signal timing optimization software package Synchro (Version 8 Build 801) has been utilized to assess queues at the I-15 Freeway on Limonite Avenue. Synchro is a macroscopic

traffic software program that is based on the signalized and unsignalized intersection capacity analyses as specified in the HCM. Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections. Equations are used to determine measures of effectiveness such as delay and queue length in Synchro. The level of service (LOS) and capacity analysis performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network.

SimTraffic is designed to model networks of signalized and unsignalized intersections, with the primary purpose of checking and fine tuning signal operations. SimTraffic uses the input parameters from Synchro to generate random simulations. The 95th percentile queue is not necessarily ever observed, it is simply based on statistical calculations (or Average Queue plus 1.65 standard deviations). However, the average queue is the average of all the two-minute maximum queues observed by SimTraffic. The maximum back of queue observed for every two-minute period is recorded by SimTraffic.

SimTraffic has been utilized to assess peak hour queuing at the I-15 Freeway on Limonite Avenue. The random simulations generated by SimTraffic have been utilized to determine the 50th and 95th percentile queue lengths observed for each turn lane. A SimTraffic simulation has been recorded five times, during the weekday AM, weekday PM and Saturday Mid-day peak hours, and has been seeded for 15-minute periods with 60-minute recording intervals.

A vehicle is considered queued whenever it is traveling at less than 10 feet/second. A vehicle will only become queued when it is either at the stop bar or behind another queued vehicle. Although only the 95th percentile queue has been utilized for purposes of determining the necessary turn pocket storage lengths, the 50th percentile queues are also reported. The 50th percentile queue is the maximum back of queue on a typical cycle during the peak hour, while the 95th percentile queue is the maximum back of queue with 95th percentile traffic volumes during the peak hour. In other words, if traffic were observed for 100 cycles, the 95th percentile queue would be the queue experienced with the 95th busiest cycle (or 5% of the time). The 50th percentile, or average, queue represents the typical queue length for peak hour traffic conditions, while the 95th percentile queue is derived from the average queue plus 1.65 standard deviations. The 95th percentile queue is not necessarily ever observed, it is simply based on statistical calculations. However, many jurisdictions utilize the 95th percentile queues for design purposes.

2.4 TRAFFIC SIGNAL WARRANT ANALYSIS METHODOLOGY

The term "signal warrants" refers to the list of established criteria used by Caltrans and other public agencies to quantitatively justify or ascertain the potential need for installation of a traffic signal at an otherwise unsignalized intersection. This TIA uses the signal warrant criteria presented in the latest edition of the Federal Highway Administration's (FHWA) *Manual on Uniform Traffic Control Devices (MUTCD)*, as amended by *the MUTCD 2012 California Supplement*, for all study area intersections. (5)

The signal warrant criteria for Existing conditions are based upon several factors, including volume of vehicular and pedestrian traffic, frequency of accidents, and location of school areas. Both the FHWA's *MUTCD* and the *MUTCD 2012 California Supplement* indicate that the installation of a traffic signal should be considered if one or more of the signal warrants are met. (5) Specifically, this TIA utilizes the Peak Hour Volume-based Warrant 3 as the appropriate representative traffic signal warrant analysis

for existing traffic conditions. Warrant 3 criteria are basically identical for both the FHWA's *MUTCD* and the *MUTCD 2012 California Supplement*. Warrant 3 is appropriate to use for this TIA because it provides specialized warrant criteria for intersections with rural characteristics (e.g. located in communities with populations of less than 10,000 persons or with adjacent major streets operating above 40 miles per hour). For the purposes of this study, the speed limit was the basis for determining whether Urban or Rural warrants were used for a given intersection.

Future unsignalized intersections have been assessed regarding the potential need for new traffic signals based on future average daily traffic (ADT) volumes, using the Caltrans planning level ADT-based signal warrant analysis worksheets.

As shown on Table 2-3, traffic signal warrant analyses were performed for the following unsignalized study area intersections during the peak weekday conditions wherein the Project is anticipated to contribute the highest trips:

TABLE 2-3: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction
6	Pats Ranch Road / Driveway 1	Jurupa Valley
7	Pats Ranch Road / Ivory Street	Jurupa Valley
8	Pats Ranch Road / 68th Street	Jurupa Valley

The Existing conditions traffic signal warrant analysis is presented in the subsequent section, Section 3 *Area Conditions* of this report. The traffic signal warrant analysis for future conditions is presented in Section 5 *Existing Plus Project Traffic Analysis,* Section 6 *EAP Traffic Analysis,* Section 7 *EAPC Traffic Analysis,* and Section 8 *Horizon Year (2035) Traffic Analysis* of this report.

It is important to note that a signal warrant defines the minimum condition under which the installation of a traffic signal might be warranted. Meeting this threshold condition does not require that a traffic control signal be installed at a particular location, but rather, that other traffic factors and conditions be evaluated in order to determine whether the signal is truly justified. It should also be noted that signal warrants do not necessarily correlate with LOS. An intersection may satisfy a signal warrant condition and operate at or above acceptable LOS or operate below acceptable LOS and not meet a signal warrant.

2.5 MINIMUM LEVEL OF SERVICE (LOS)

The definition of an intersection deficiency has been obtained from each of the applicable surrounding jurisdictions.

2.5.1 CITY OF JURUPA VALLEY

Per Policy C-10 of the County of Riverside General Plan, the following LOS will be utilized for study area intersections located within the City: Seek to maintain the following target levels of service: "C" along all City-maintained roads. A peak hour level of service of "D" may be allowed in commercial and

employment areas, and at intersections of any combination of Major Highways, Urban Arterials, Secondary Highways, or freeway ramp intersections.

For each of the off-site study area intersections within the City of Jurupa Valley the intersecting roadways were found to be Secondary Highway or higher on the City's General Plan Circulation Element. As such, the minimum level of service applicable to the study area intersections is LOS "D". Therefore, any intersection operating at LOS "E" or worse will be considered deficient and LOS "D" or worse at the Project access points will be considered deficient for the purposes of this analysis.

2.5.2 CITY OF EASTVALE

For the study intersection located in the City of Eastvale LOS "D" is also the minimum acceptable condition that should be maintained during the peak commute hours.

2.5.3 CALTRANS

Caltrans endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on SHS facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than this target LOS, the existing LOS should be maintained. In general, the region-wide goal for an acceptable LOS on all freeways, roadway segments, and intersections is LOS "D". Consistent with the City of Jurupa Valley LOS threshold of LOS "D", LOS "D" will be used as the target LOS for freeway ramps.

2.6 THRESHOLDS OF SIGNIFICANCE

This section outlines the methodology used in this analysis related to identifying circulation system deficiencies.

For purposes of analyzing California Environmental Quality Act (CEQA) impacts, the City of Jurupa Valley identifies significant impacts through a comparison of Existing and EAP traffic conditions.

- First, when the pre-Project condition is at or better than the acceptable LOS, and project-generated traffic causes deterioration below the acceptable LOS, a significant project-specific impact is deemed to occur.
- However, when the pre-Project condition is already deficient, and the Project is anticipated to contribute traffic, the Project's contribution to the cumulative impact would be cumulatively considerable.

The proposed significance thresholds were applied at study area intersections for the purposes of determining project-related impacts.

For the purposes of this analysis, the same thresholds have also been applied to the Caltrans ramp-to-arterial intersections.

2.7 PROJECT FAIR SHARE CALCULATION METHODOLOGY

In cases where this TIA identifies that the Project would contribute additional traffic volumes to cumulative traffic deficiencies, Project fair share costs of improvements necessary to address deficiencies have been identified. The Project's fair share cost of improvements is determined based on the following equation, which is the ratio of Project traffic to new traffic, and new traffic is total future traffic less existing baseline traffic:

Project Fair Share % = Project Traffic / (2035 Total Traffic – Existing Traffic)

The Project fair share contribution calculations are presented in Section 10 *Local and Regional Funding Mechanisms* of this TIA.

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3 AREA CONDITIONS

This section provides a summary of the existing circulation network, the City of Jurupa Valley General Plan Circulation Network, and a review of existing peak hour intersection operations and traffic signal warrant analyses.

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the agreement with City of Jurupa Valley staff (Appendix "1.1"), the study area includes a total of 9 existing and future intersections as shown previously on Exhibit 1-2. Exhibit 3-1 illustrates the study area intersections located near the proposed Project and identifies the number of through traffic lanes for existing roadways and intersection traffic controls.

3.2 CITY OF JURUPA VALLEY GENERAL PLAN CIRCULATION ELEMENT

3.2.1 CITY OF JURUPA VALLEY/CITY OF EASTVALE

As previously noted, the Project site is located within the City of Jurupa Valley. Exhibit 3-2 shows the City of Jurupa Valley General Plan Circulation Element, and Exhibit 3-3 illustrates the City of Jurupa Valley General Plan roadway cross-sections. The City of Jurupa Valley has adopted the County of Riverside General Plan Circulation Element for the Jurupa area.

The City of Eastvale adopted their General Plan in June 2012. Exhibit 3-4 shows the City of Eastvale General Plan Circulation Element and Exhibit 3-5 shows the City of Eastvale General Plan roadway cross-sections.

The roadway classifications and planned (ultimate) roadway cross-sections of the major roadways within the City of Jurupa Valley and City of Eastvale as identified on their respective General Plan Circulation Elements are described subsequently.

Urban Arterial Highways are high-speed/high-capacity roads that provide access to regional transportation facilities. Urban Arterial Highways are primarily for through traffic where anticipated traffic volumes exceed four-lane capacities and access from other streets/highways should be limited to approximately one-quarter mile intervals. The study area roadways that are classified as Urban Arterial Highways are identified as having a 152-foot right-of-way and 110-foot curb-to-curb measurement. Urban Arterials Highways include three lanes of travel in each direction and a 14-foot curbed and/or landscaped median. The following study area roadway within the City of Jurupa Valley and City of Eastvale is classified as an Urban Arterial Highway:

- Limonite Avenue

EXHIBIT 3-1: EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS

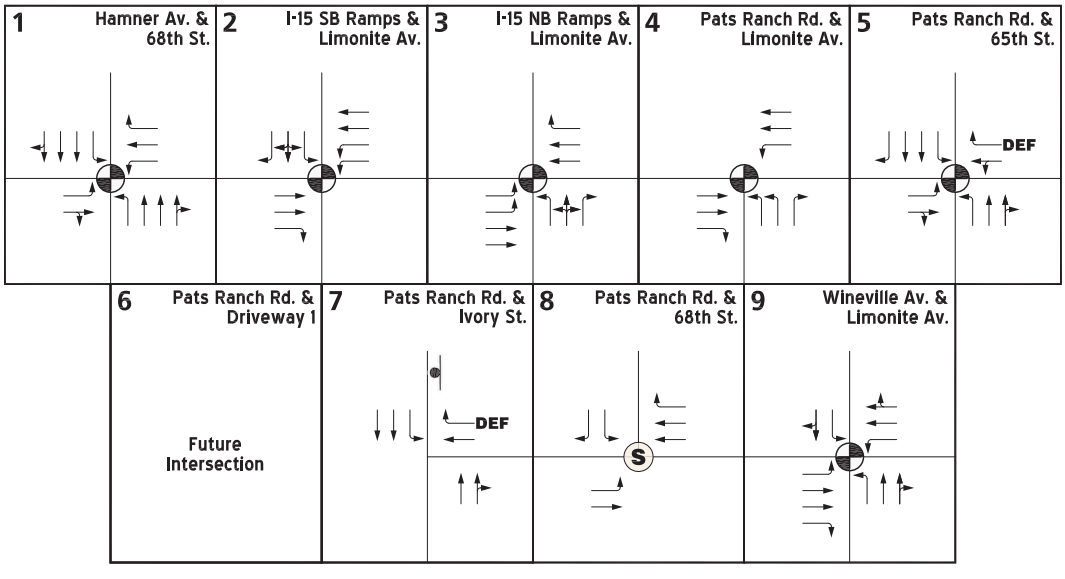
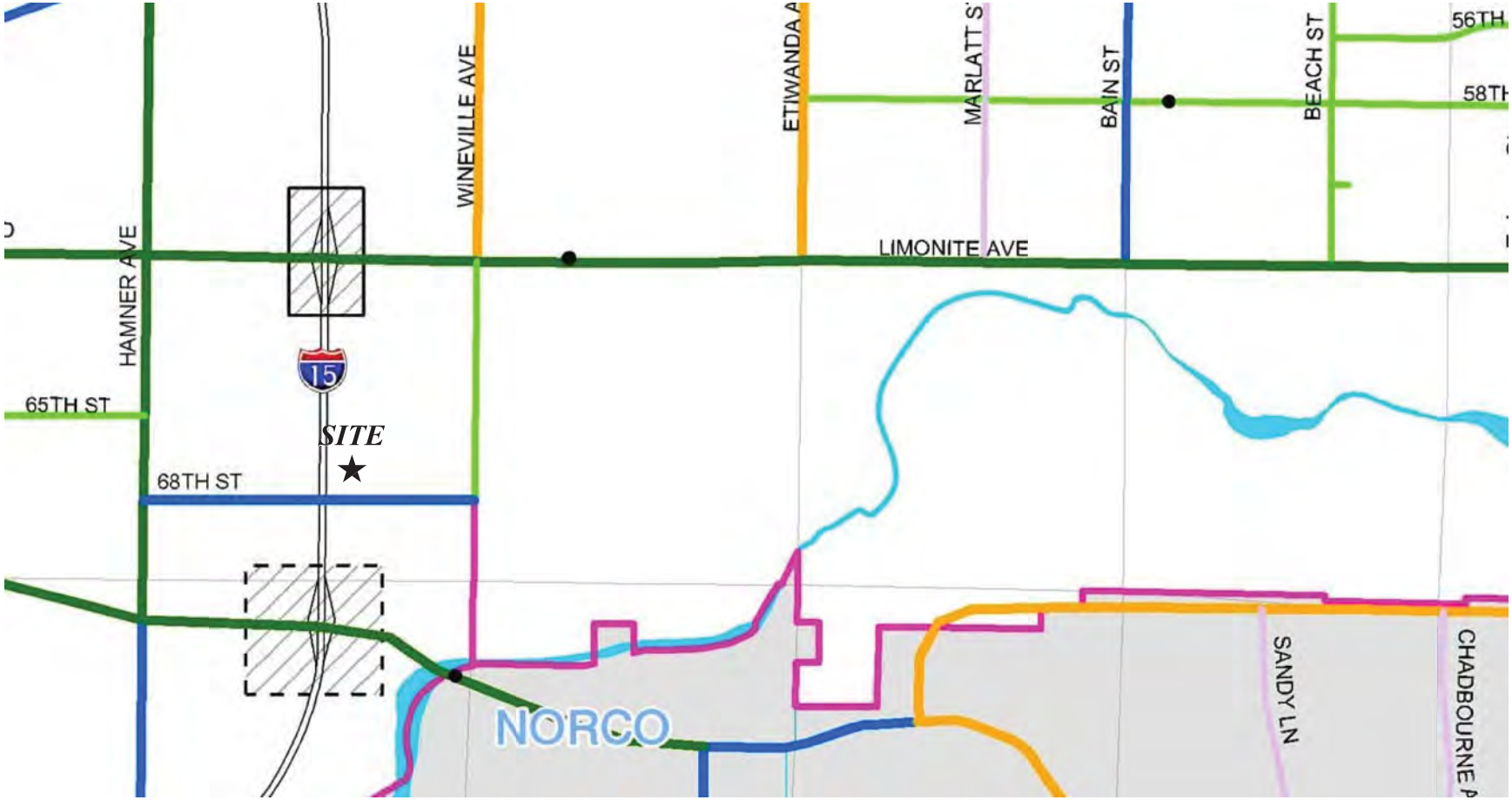
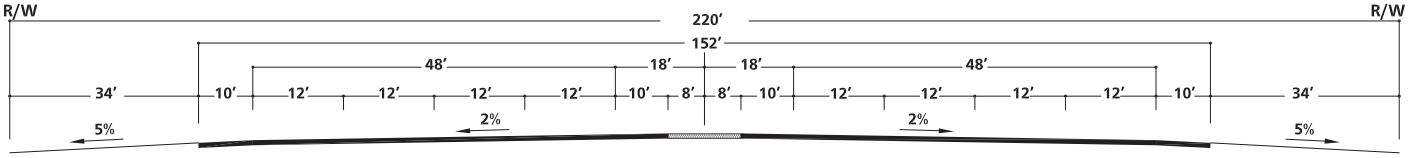


EXHIBIT 3-2: CITY OF JURUPA VALLEY CIRCULATION ELEMENT

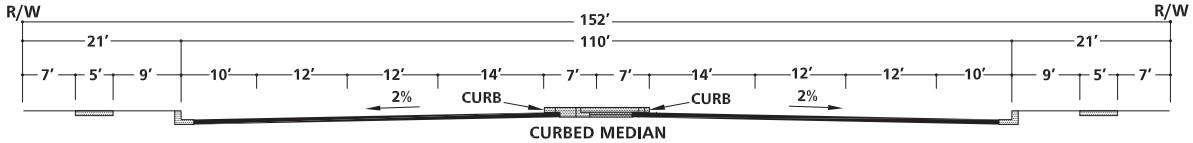


SOURCE: RIVERSIDE COUNTY INTEGRATED PROJECT (RCIP) (OCTOBER 7, 2003)

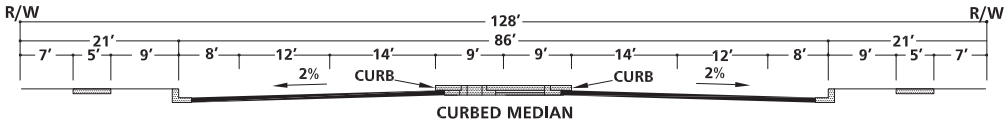
EXHIBIT 3-3: CITY OF JURUPA VALLEY GENERAL PLAN ROADWAY CROSS-SECTIONS



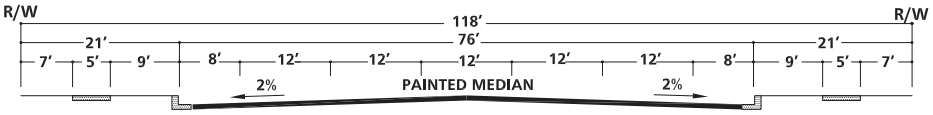
EXPRESSWAY - 8 LANES



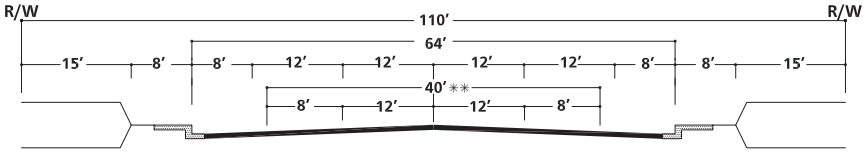
URBAN ARTERIAL HIGHWAY ✳



ARTERIAL HIGHWAY ✳

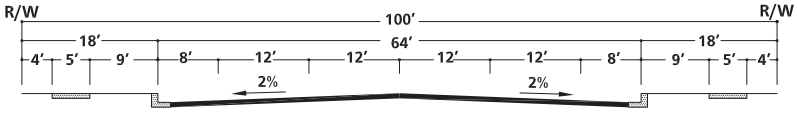


MAJOR HIGHWAY - 4 LANES

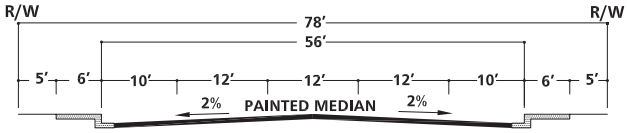


MOUNTAIN ARTERIAL - 2 TO 4 LANES

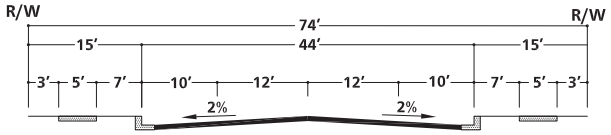
✳✳ 2 LANE SECTION



SECONDARY HIGHWAY



INDUSTRIAL COLLECTOR



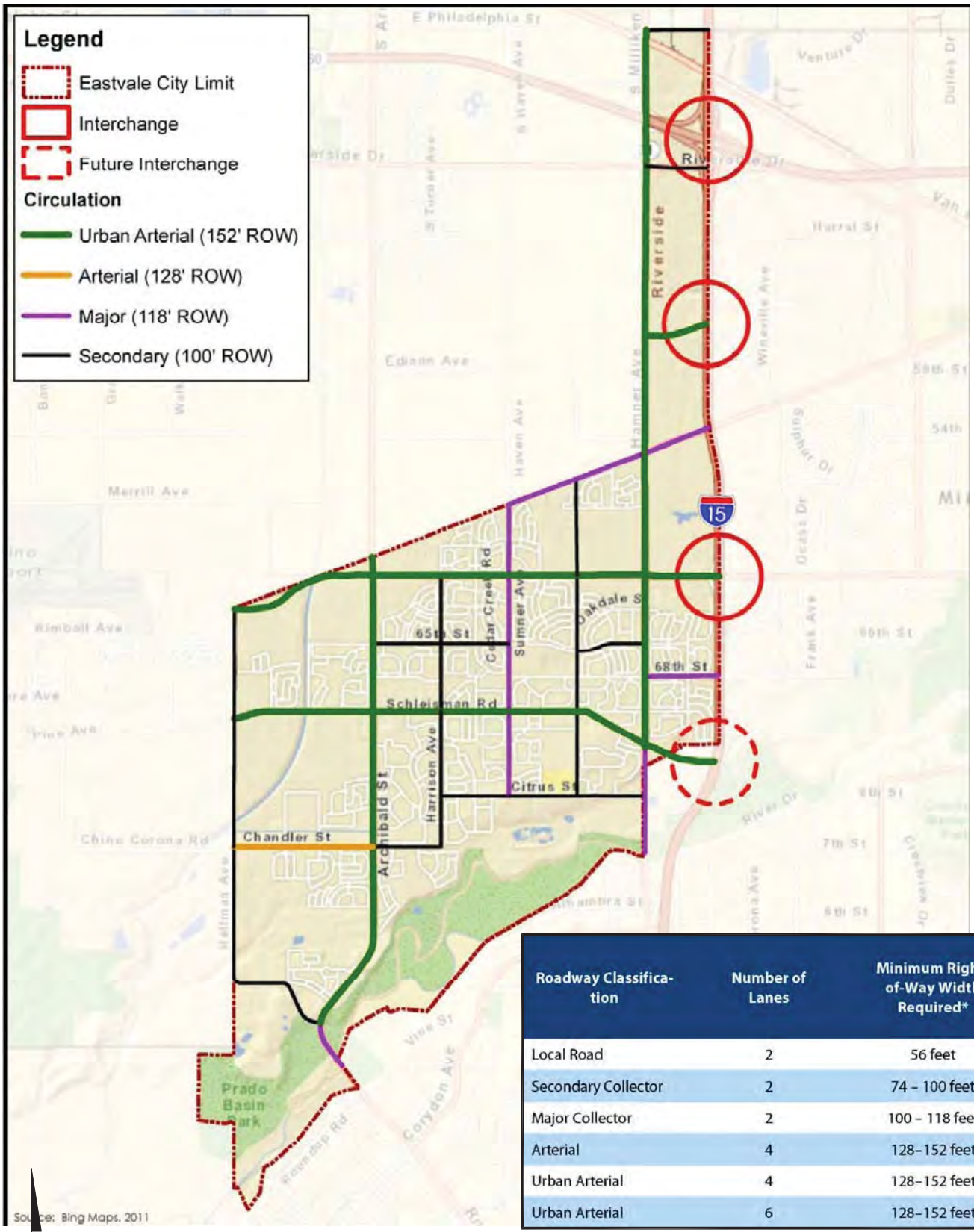
COLLECTOR

✳ *IMPROVEMENTS MAY BE RECONFIGURED TO ACCOMMODATE EXCLUSIVE TRANSIT LANES OR ALTERNATIVE LANE ARRANGEMENTS ADDITIONAL RIGHT OF WAY MAY BE REQUIRED AT INTERSECTIONS TO ACCOMMODATE ULTIMATE IMPROVEMENTS FOR STATE HIGHWAYS SHALL CONFORM TO CALTRANS DESIGN STANDARDS.*

NOT TO SCALE

SOURCE: COUNTY OF RIVERSIDE

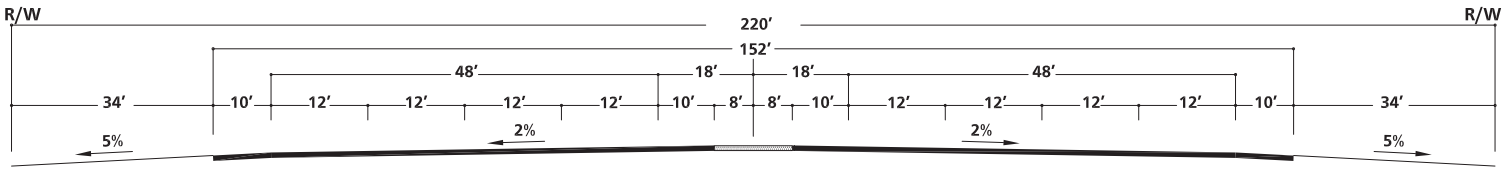
EXHIBIT 3-4: CITY OF EASTVALE GENERAL PLAN CIRCULATION ELEMENT



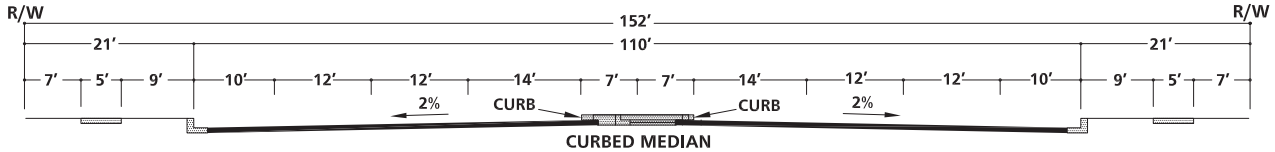
Roadway Classification	Number of Lanes	Minimum Right-of-Way Width Required*
Local Road	2	56 feet
Secondary Collector	2	74 – 100 feet
Major Collector	2	100 – 118 feet
Arterial	4	128–152 feet
Urban Arterial	4	128–152 feet
Urban Arterial	6	128–152 feet

SOURCE: CITY OF EASTVALE GENERAL PLAN
ADOPTED: JUNE 13, 2012

EXHIBIT 3-5: CITY OF EASTVALE GENERAL PLAN ROADWAY CROSS-SECTIONS

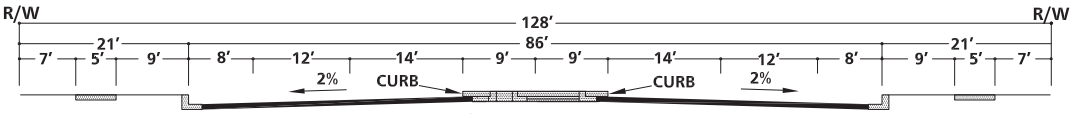


EXPRESSWAY - 8 LANES



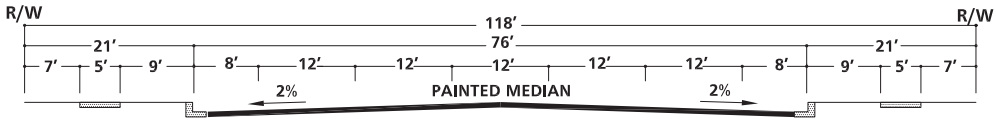
CURBED MEDIAN

URBAN ARTERIAL HIGHWAY *

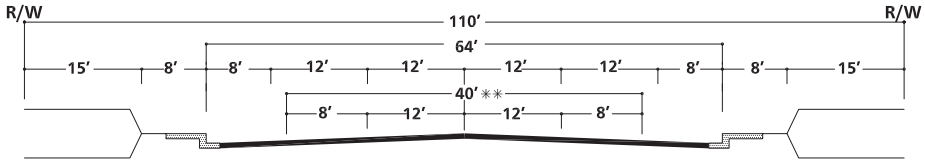


CURBED MEDIAN

ARTERIAL HIGHWAY *

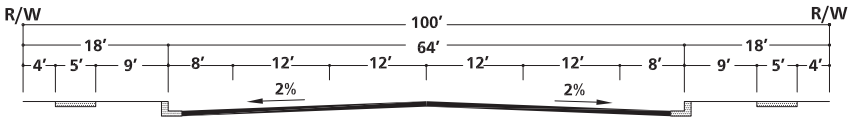


MAJOR HIGHWAY - 4 LANES

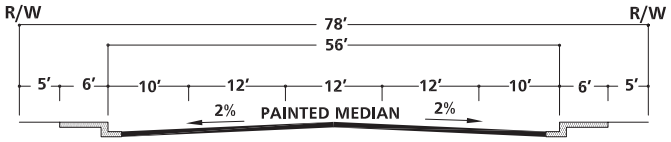


MOUNTAIN ARTERIAL - 2 TO 4 LANES

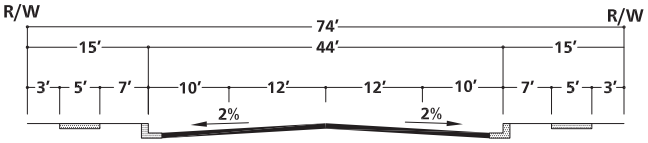
** 2 LANE SECTION



SECONDARY HIGHWAY



INDUSTRIAL COLLECTOR



COLLECTOR

* *IMPROVEMENTS MAY BE RECONFIGURED TO ACCOMMODATE EXCLUSIVE TRANSIT LANES OR ALTERNATIVE LANE ARRANGEMENTS ADDITIONAL RIGHT OF WAY MAY BE REQUIRED AT INTERSECTIONS TO ACCOMMODATE ULTIMATE IMPROVEMENTS FOR STATE HIGHWAYS SHALL CONFORM TO CALTRANS DESIGN STANDARDS.*

NOT TO SCALE

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Arterial Highways are divided highways for through traffic to which access from abutting property shall be kept at a minimum and access from other streets/highways should be limited to approximately one-quarter mile intervals. The study area roadways that are classified as Arterial Highways are identified as having a 128-foot right-of-way and 86-foot curb-to-curb measurement. Arterial Highways include two lanes of travel in each direction and an 18-foot curbed and/or landscaped median. The following study area roadways within the City of Jurupa Valley are classified as Arterial Highways:

- Wineville Avenue, north of Limonite Avenue

Major Highways are intended to serve property zoned for major industrial and commercial uses, or to serve through traffic. Access from other streets/highways should be limited to approximately 660-foot intervals. The study area roadways that are classified as Major Highways are identified as having 118-foot right-of-way and 76-foot curb-to-curb measurement. Major Highways include two lanes of travel in each direction, divided by a 12-foot painted median (two-way-left-turn lane). The following study area roadway within the City of Eastvale is classified as a Major Highway:

- Hamner Avenue, south of Limonite Avenue

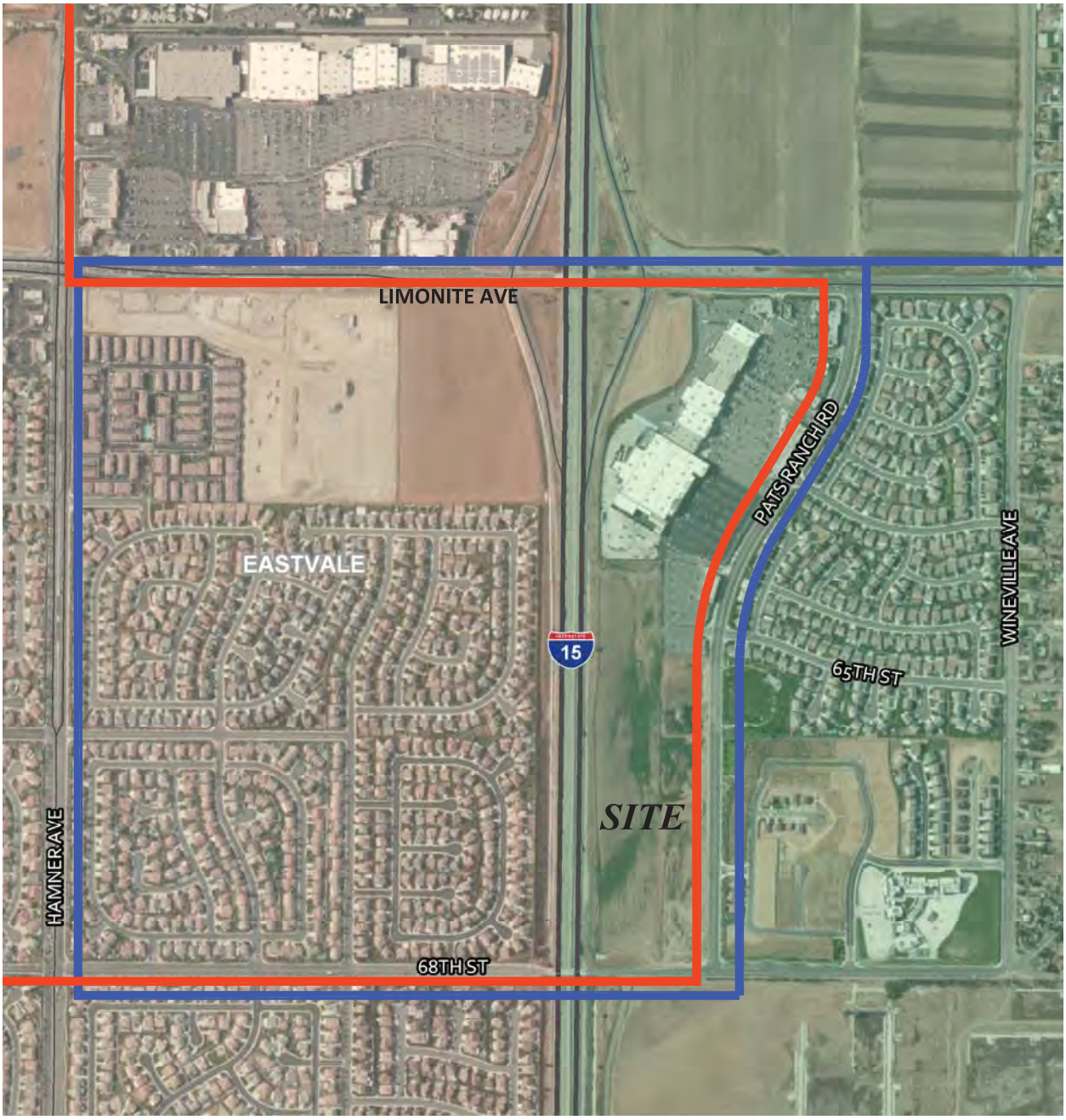
Secondary Highways are intended to through traffic along longer routes between major traffic generating areas or to serve property zoned for multiple residential, secondary industrial or commercial uses. Access from other streets/highways should be limited to approximately 330-foot intervals. The study area roadways that are classified as Secondary Highways are identified as having 100-foot right-of-way and 64-foot curb-to-curb measurement. Secondary Highways include two lanes of travel in each direction. The following study area roadway within the City of Jurupa Valley is classified as a Secondary Highway:

- Wineville Avenue, south of Limonite Avenue

3.3 TRANSIT SERVICE

The study area is currently served by the Riverside Transit Authority (RTA), a public transit agency serving the unincorporated Riverside County region near the City of Jurupa Valley, with bus service along Hamner Avenue, Limonite Avenue, Pats Ranch Road and 68th Street via RTA Route 29 and Route 3 (see Exhibit 3-6). Based on a review of the existing transit routes within the vicinity of the proposed Project, both existing routes appear to feasibly serve the Project in the future. There are existing stops for Routes 3 and 29 along Pats Ranch Road, just north of 64th Street and just south of 64th Street on the west side. These existing stops would likely serve the Project. Transit service is reviewed and updated by RTA periodically to address ridership, budget and community demand needs. Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate.

EXHIBIT 3-6: EXISTING TRANSIT SERVICES



LEGEND:

= RTA ROUTE 29

= RTA ROUTE 3

N

SOURCE: RIVERSIDE TRANSIT AGENCY (RTA)

3.4 BICYCLE & PEDESTRIAN FACILITIES

Field observations conducted in March 2014 indicate nominal pedestrian and bicycle activity within the study area. Existing pedestrian facilities within the study area are shown on Exhibit 3-7. Exhibit 3-8 illustrates the Jurupa Area Plan Trails and Bikeway System. The study area currently includes Class II bikeways and also a Class I horse trail in the City of Jurupa Valley along Wineville Avenue and Limonite Avenue. Class II bikeways, also referred to as "bike lanes," are intended to delineate the right-of-way assigned to bicyclists and motorists, and to provide for more predictable movements of each. Bike lane signs and pavement marking help define the bikeway. A more important reason for bike lanes is to better accommodate bicyclists through corridors where insufficient room exists for safe bicycling on existing streets.

3.5 EXISTING (2014) TRAFFIC COUNTS

The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected in May 2014. The following peak hours were selected for analysis:

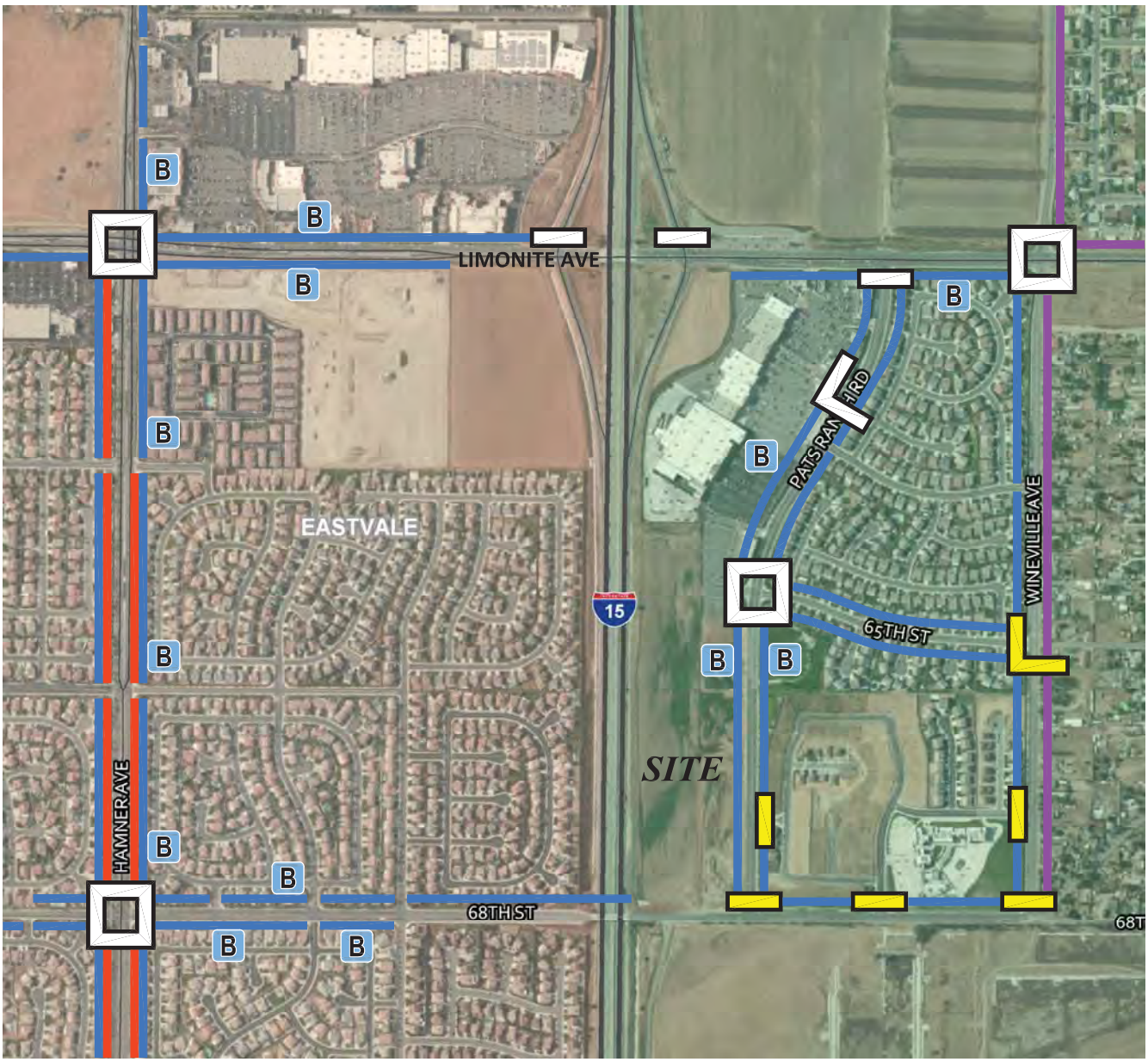
- Weekday AM Peak Hour (peak hour between 7:00 AM and 9:00 AM)
- Weekday PM Peak Hour (peak hour between 4:00 PM and 6:00 PM)
- Weekday Mid-day Peak Hour (peak hour between 1:00 PM and 3:00 PM)

The weekday AM, weekday Mid-day, and weekday PM peak hour count data is representative of typical weekday peak hour traffic conditions in the study area. Pursuant to discussions with City staff, only intersections along 68th Street and Pats Ranch Road, south of Limonite Avenue were evaluated during the weekday mid-day peak hour to determine the operational effects of the near-by elementary school to these study area intersections. There were no observations made in the field that would indicate atypical traffic conditions on the count dates, such as construction activity or detour routes and near-by schools were in session and operating on normal schedules. The raw manual peak hour turning movement traffic count data sheets are included in Appendix “3.1”. These raw turning volumes have been flow conserved between intersections with limited access, no access and where there are currently no uses generating traffic (e.g., between ramp-to-arterial intersections, etc.).

The traffic counts collected in May 2014 for the Caltrans ramp-to-arterial facilities include the vehicle classifications as shown below:

- Passenger Cars
- 2-Axle Trucks
- 3-Axle Trucks
- 4 or More Axle Trucks

EXHIBIT 3-7: EXISTING PEDESTRIAN FACILITIES



LEGEND:

- B = BUS STOP
- = CROSSWALK
- = SCHOOL CROSSWALK
- = SIDEWALK
- = CLASS I HORSE TRAIL
- = CLASS II BIKE LANE

N

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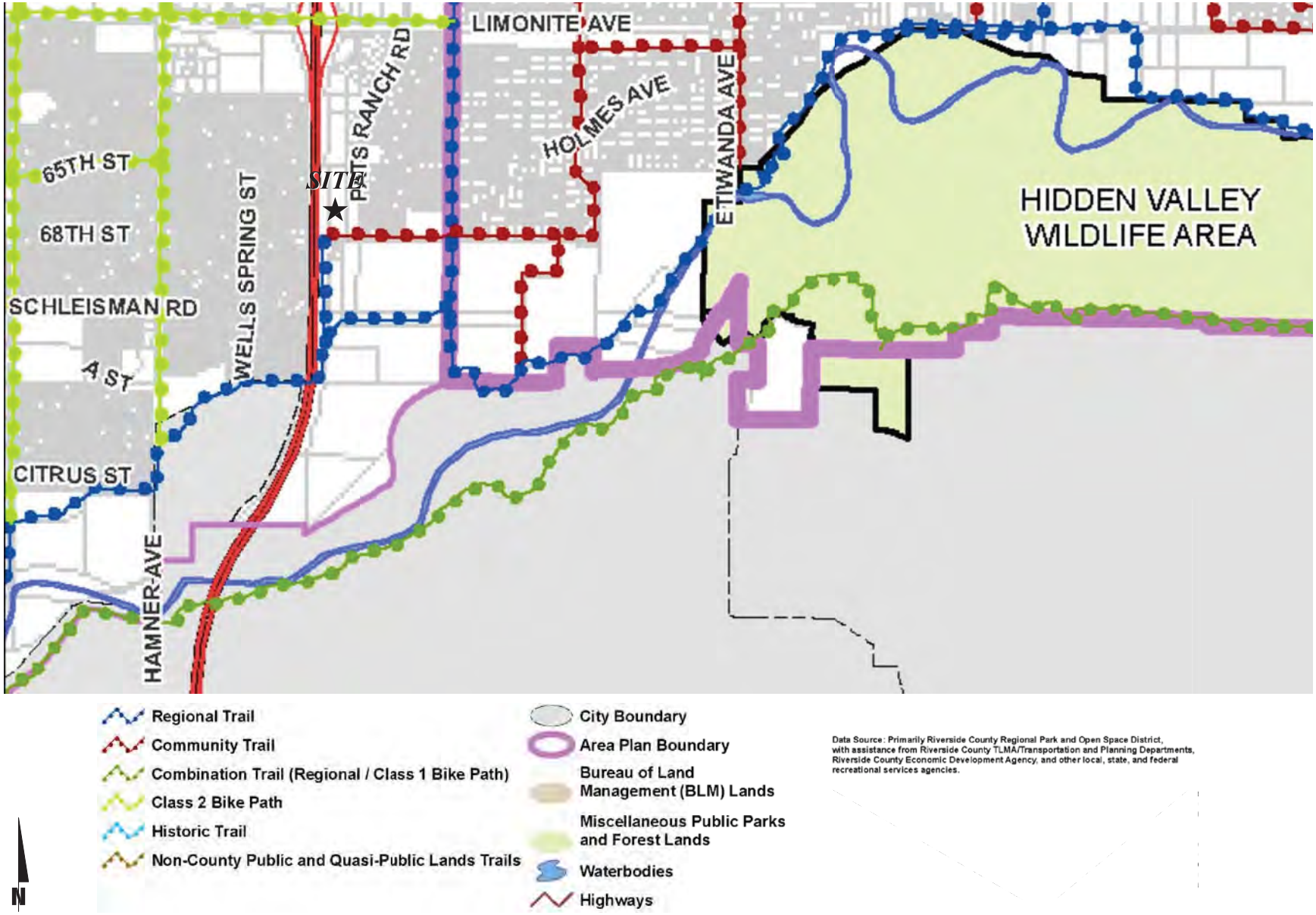
URBAN CROSSROADS

EXHIBIT 3-8: JURUPA AREA PLAN TRAILS AND BIKEWAY SYSTEM



Existing weekday average daily traffic (ADT) volumes on arterial highways throughout the study area are shown on Exhibit 3-9. Existing ADT volumes are based upon factored intersection peak hour counts collected by Urban Crossroads, Inc. using the following formula for each intersection leg:

Weekday PM Peak Hour (Approach Volume + Exit Volume) x 14.28 = Leg Volume

A comparison of the PM peak hour and daily traffic volumes of various roadway segments within the study area indicated that the peak-to-daily relationship is approximately 7.00 percent. As such, the above equation utilizing a factor of 14.28 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 7.00 percent (i.e., 1/0.0700 = 14.2800) and was assumed to sufficiently estimate average daily traffic (ADT) volumes for planning-level analyses. Existing weekday AM and weekday PM peak hour intersection volumes are also shown on Exhibit 3-9. Existing weekday Mid-day peak hour intersection volumes are shown on Exhibit 3-10.

3.6 EXISTING (2014) CONDITIONS INTERSECTION OPERATIONS ANALYSIS

Existing peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2.2 *Intersection Capacity Analysis* of this report. The intersection operations analysis results are summarized in Table 3-1 which indicates that the following existing study area intersection is currently operating at an unacceptable LOS during the peak hours:

ID	Intersection Location
8	Pats Ranch Road / 68th Street – LOS "E" AM peak hour only

The intersection operations analysis worksheets are included in Appendix "3.2" of this TIA.

3.7 EXISTING (2014) CONDITIONS TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants for Existing traffic conditions are based on existing peak hour intersection turning volumes. The intersection of Pats Ranch Road and 68th Street currently warrants a traffic signal for Existing traffic conditions.

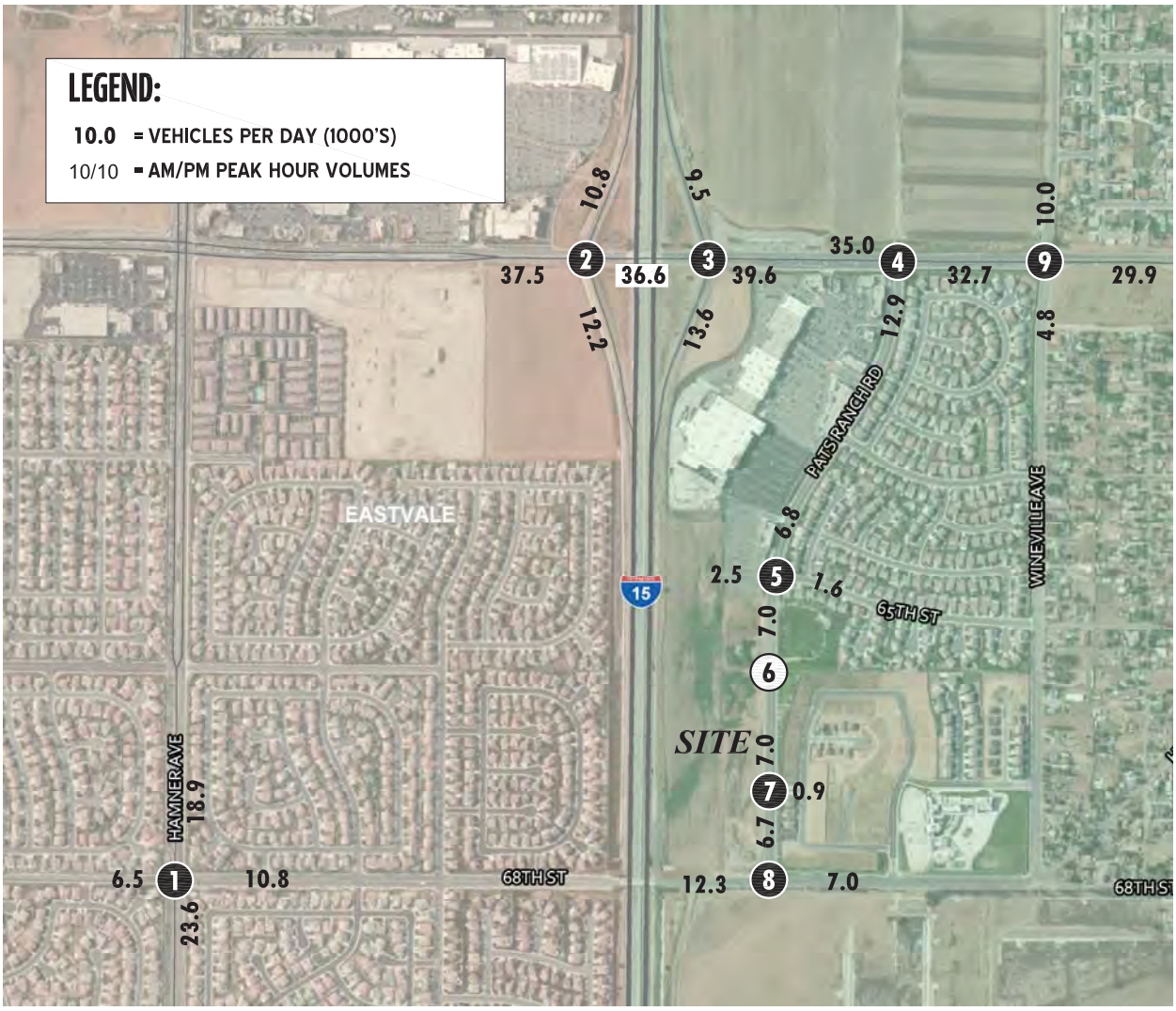
Existing conditions traffic signal warrant analysis worksheets are provided in Appendix "3.3".

3.8 EXISTING (2014) CONDITIONS OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the southbound and northbound off-ramps at the I-15 Freeway at Limonite Avenue interchange to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-15 Freeway mainline. Queuing analysis findings are presented in Table 3-2. Off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown on Table 3-2, there are no movements currently experiencing queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows. Field observations indicate that there are no queues currently spilling back from the off-ramps onto the I-15 Freeway mainline during the peak hours. As such, the findings are consistent with existing field observations.

Worksheets for Existing conditions off-ramp queuing analysis are provided in Appendix "3.4".

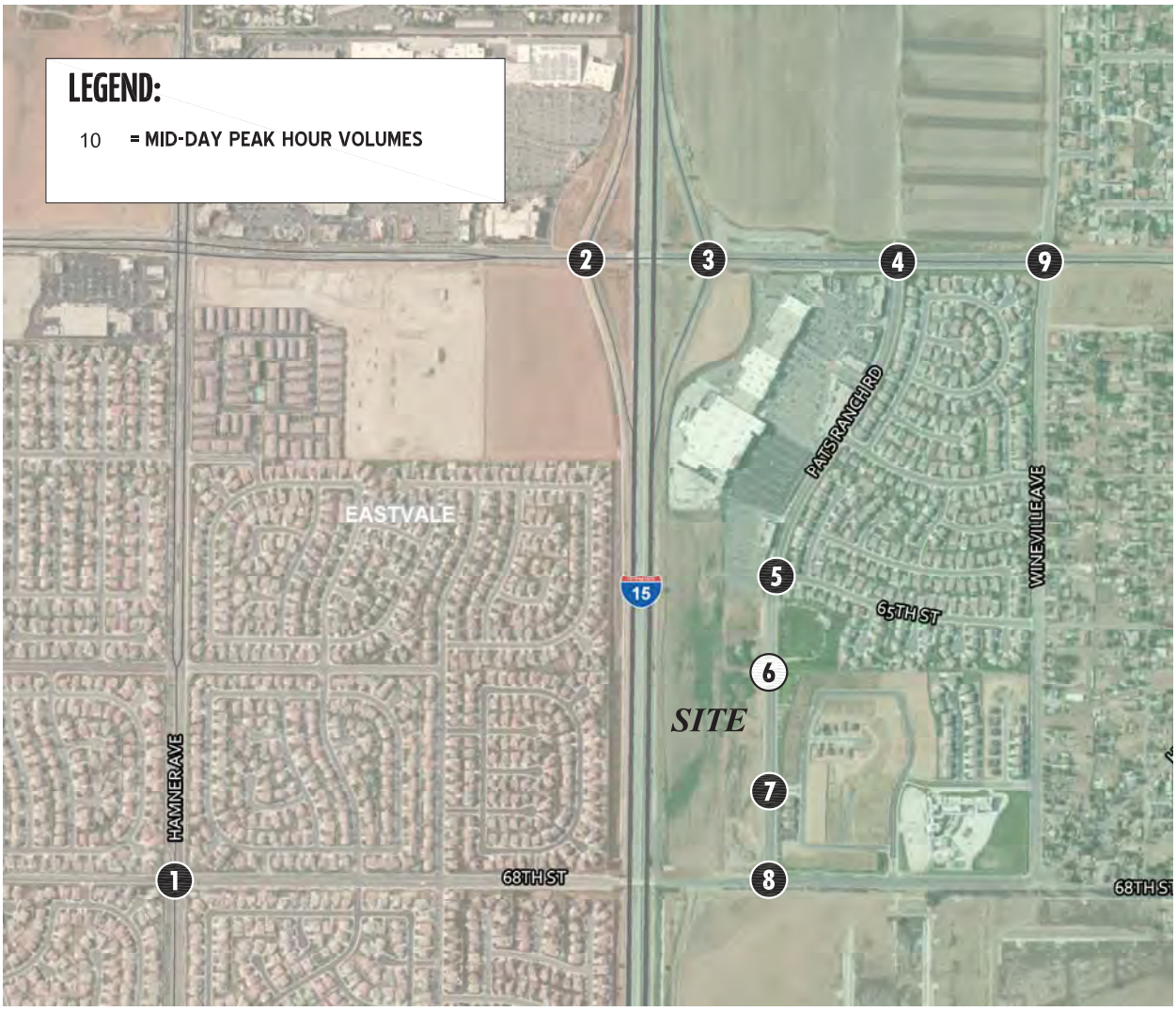
EXHIBIT 3-9: EXISTING (2014) VOLUMES



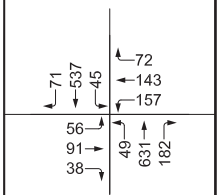
1 Hamner Av. & 68th St.	2 I-15 SB Ramps & Limonite Av.	3 I-15 NB Ramps & Limonite Av.	4 Pats Ranch Rd. & Limonite Av.	5 Pats Ranch Rd. & 65th St.
38(60) 497(561) 51(96) → 78(76) ← 170(129) ← 223(161)	428(539) 0(1) 118(216) → 568(857) ← 577(415)	→ 321(242) ← 940(940)	← 933(880) ← 55(218)	0(8) 119(250) 7(51) → 33(19) ← 6(22) ← 41(7)
108(56) → 175(106) → 76(34) →	961(1073) → 423(441) →	666(404) → 413(885) →	600(1039) → 90(229) →	19(34) → 5(6) → 19(27) →
45(69) 646(636) 151(188) →		205(332) 2(17) 272(601) →	328(302) 49(151) →	44(81) 246(114) 30(10) →

6 Pats Ranch Rd. & Driveway 1	7 Pats Ranch Rd. & Ivory St.	8 Pats Ranch Rd. & 68th St.	9 Wineville Av. & Limonite Av.
Future Intersection	146(257) 33(27) → 83(16) ← 72(6)	193(233) 25(30) → 35(16) ← 379(209)	120(194) 77(90) 40(127) → 29(74) ← 812(853) ← 26(52)
	237(189) → 48(16) →	250(189) → 407(232) →	69(169) → 532(956) → 48(65) →
			56(51) 105(46) 46(33) →

EXHIBIT 3-10: EXISTING (2014) MID-DAY VOLUMES



1 Hamner Av. & 68th St.



2 I-15 SB Ramps & Limonite Av.

Not Analyzed for Mid-Day Peak Hour Conditions

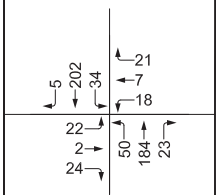
3 I-15 NB Ramps & Limonite Av.

Not Analyzed for Mid-Day Peak Hour Conditions

4 Pats Ranch Rd. & Limonite Av.

Not Analyzed for Mid-Day Peak Hour Conditions

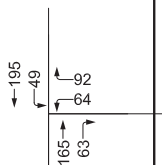
5 Pats Ranch Rd. & 65th St.



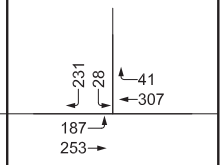
6 Pats Ranch Rd. & Driveway 1

Future Intersection

7 Pats Ranch Rd. & Ivory St.



8 Pats Ranch Rd. & 68th St.



9 Wineville Av. & Limonite Av.

Not Analyzed for Mid-Day Peak Hour Conditions

Table 3-1

Existing (2014) Conditions Intersection Analysis

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)			Level of Service			Acceptable LOS
			Northbound			Southbound			Eastbound			Westbound									
			L	T	R	L	T	R	L	T	R	L	T	R	AM	Mid	PM	AM	Mid	PM	
1	Hamner Av. / 68th Street	TS	1	3	0	1	3	0	1	1	0	1	1	1	37.8	28.8	29.7	D	C	C	D
2	I-15 SB Ramps / Limonite Av.	TS	0	0	0	1	1	1	0	2	1	2	2	0	30.2	N/A	33.0	C	N/A	C	D
3	I-15 NB Ramps / Limonite Av.	TS	1	1	1	0	0	0	2	2	0	0	2	1	32.7	N/A	37.7	C	N/A	D	D
4	Pats Ranch Rd. / Limonite Av.	TS	2	0	1	0	0	0	0	2	1	1	2	0	10.5	N/A	15.1	B	N/A	B	D
5	Pats Ranch Rd. / 65th St.	TS	1	2	0	1	2	1	1	1	0	0	1	d	12.5	12.3	15.5	B	B	B	D
6	Pats Ranch Rd. / Driveway 1	Future Intersection Analysis Location													--	--	--	--	--	--	D
7	Pats Ranch Rd. / Ivory St.	CSS	0	2	0	1	2	0	0	0	0	1	0	d	16.3	16.4	12.0	C	C	B	D
8	Pats Ranch Rd. / 68th St.	AWS	0	0	0	1	0	1	1	1	0	0	2	1	**48.1**	23.3	13.5	**E**	C	B	D
9	Wineville Av. / Limonite Av.	TS	1	2	0	1	1	0	1	2	1	1	2	0	22.0	N/A	27.3	C	N/A	C	D

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

N/A = Not applicable. Intersection not evaluated during the mid-day peak hour.

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; >> = Free-Right Turn Lane; d= Defacto Right Turn Lane

[2] Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. The I-15 ramp locations have been analyzed using the Synchro Software (Version 8).

[3] CSS = Cross-street Stop; AWS = All-Way Stop; TS = Traffic Signal

3.9 RECOMMENDED IMPROVEMENTS

Improvement strategies have been recommended at intersections that have been identified as deficient to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS "D" or better). The effectiveness of the proposed recommended improvements is presented in Table 3-3 for Existing traffic conditions. Recommended improvements to address deficiencies for Existing traffic conditions are described below.

Recommended Improvement – Pats Ranch Road / 68th Street (#8)

- Add a traffic signal and overlap phasing on the southbound right turn movement.

The intersection operations analysis worksheets, with improvements, are included in Appendix "3.5" of this TIA.

Table 3-2

Existing (2014) Conditions
Peak Hour Off-Ramp Queuing Analysis

Intersection	Movement	Stacking (Feet)	95th Percentile Stacking Distance Required (Feet)		Acceptable? [1]	
			AM Peak Hour	PM Peak Hour	AM	PM
I-15 SB Off-Ramp / Limonite Av.						
	SBL	400	130	196	Yes	Yes
	SBL/T/R	1,175	235	265	Yes	Yes
	SBR	400	199	249	Yes	Yes
I-15 NB Off-Ramp / Limonite Av.						
	NBL	450	157	251	Yes	Yes
	NBL/T/R	1,290	221	319	Yes	Yes
	NBR	450	189	284	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

Table 3-3

Existing (2014) Conditions Intersection Analysis With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)			Level of Service		
			Northbound			Southbound			Eastbound			Westbound								
			L	T	R	L	T	R	L	T	R	L	T	R	AM	Mid	PM	AM	Mid	PM
8	Pats Ranch Rd. / 68th St.																			
	- Without Improvements	AWS	0	0	0	1	0	1	1	1	0	0	2	1	**48.1**	23.3	13.5	**E**	C	B
	- With Improvements	**TS**	0	0	0	1	0	**1>**	1	1	0	0	2	1	22.3	16.1	18.4	C	B	B

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; > = Right-Turn Overlap Phasing; **1** = Improvement

[2] Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control.

[3] AWS = All-Way Stop; TS = Traffic Signal

4 PROJECTED FUTURE TRAFFIC

This section presents the traffic volumes estimated to be generated by the Project, as well as the Project's trip assignment onto the study area roadway network. The Project is proposed to consist of the development of 397 apartment units. For the purposes of this analysis, it is assumed that the Project will be constructed within a single development phase. The Project is anticipated to be fully built and occupied by Year 2016.

The Project is proposed to have access on Pats Ranch Road, with right-in/right-out access only at Driveway 1 and full-access (i.e., no restricted turning movements) at Driveway 2. Driveway 2 is proposed to align with the existing Ivory Street on Pats Ranch Road. Regional access to the project site is provided via the I-15 Freeway and Limonite Avenue interchange.

4.1 PROJECT TRIP GENERATION

Trip generation represents the amount of traffic which is both attracted to and produced by a development. Determining traffic generation for a specific project is therefore based upon forecasting the amount of traffic that is expected to be both attracted to and produced by the specific land uses being proposed for a given development.

Trip generation rates used to estimate Project traffic and a summary of the Project's trip generation are shown in Table 4-1. The trip generation rates are based upon data collected by the Institute of Transportation Engineers (ITE) for Apartments (ITE Land Use Code 220) land use in their published Trip Generation manual, 9th Edition, 2012. (2)

In an effort to conduct a conservative analysis, the weekday PM peak hour trip generation has been utilized for the weekday Mid-day peak hour operations analysis. The Project would generate an estimated 2,640 total trip-ends per day on a typical weekday with an estimated 202 weekday AM peak hour trips and 246 weekday PM peak hour trips.

4.2 PROJECT TRIP DISTRIBUTION

Trip distribution is the process of identifying the probable destinations, directions or traffic routes that will be utilized by Project traffic. The potential interaction between the planned land uses and surrounding regional access routes are considered, to identify the route where the Project traffic would distribute. The Project trip distribution was developed based on anticipated travel patterns to and from the Project site for both passenger cars and truck traffic.

The trip distribution patterns are heavily influenced by the geographical location of the site, the location of surrounding uses, and the proximity to the regional freeway system. Exhibit 4-1 illustrates the trip distribution patterns for the Project.

It is anticipated that the existing/planned uses within the Vernola Marketplace, Eastvale Gateway North, and Eastvale Gateway South shopping centers could absorb the Project traffic proposed to interact with these existing shopping centers. 5 percent of the Project equates to approximately 10

Table 4-1

Project Trip Generation Rates[1]

Land Use	ITE Code	Units[2]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Apartments	220	DU	0.10	0.41	0.51	0.40	0.22	0.62	6.65

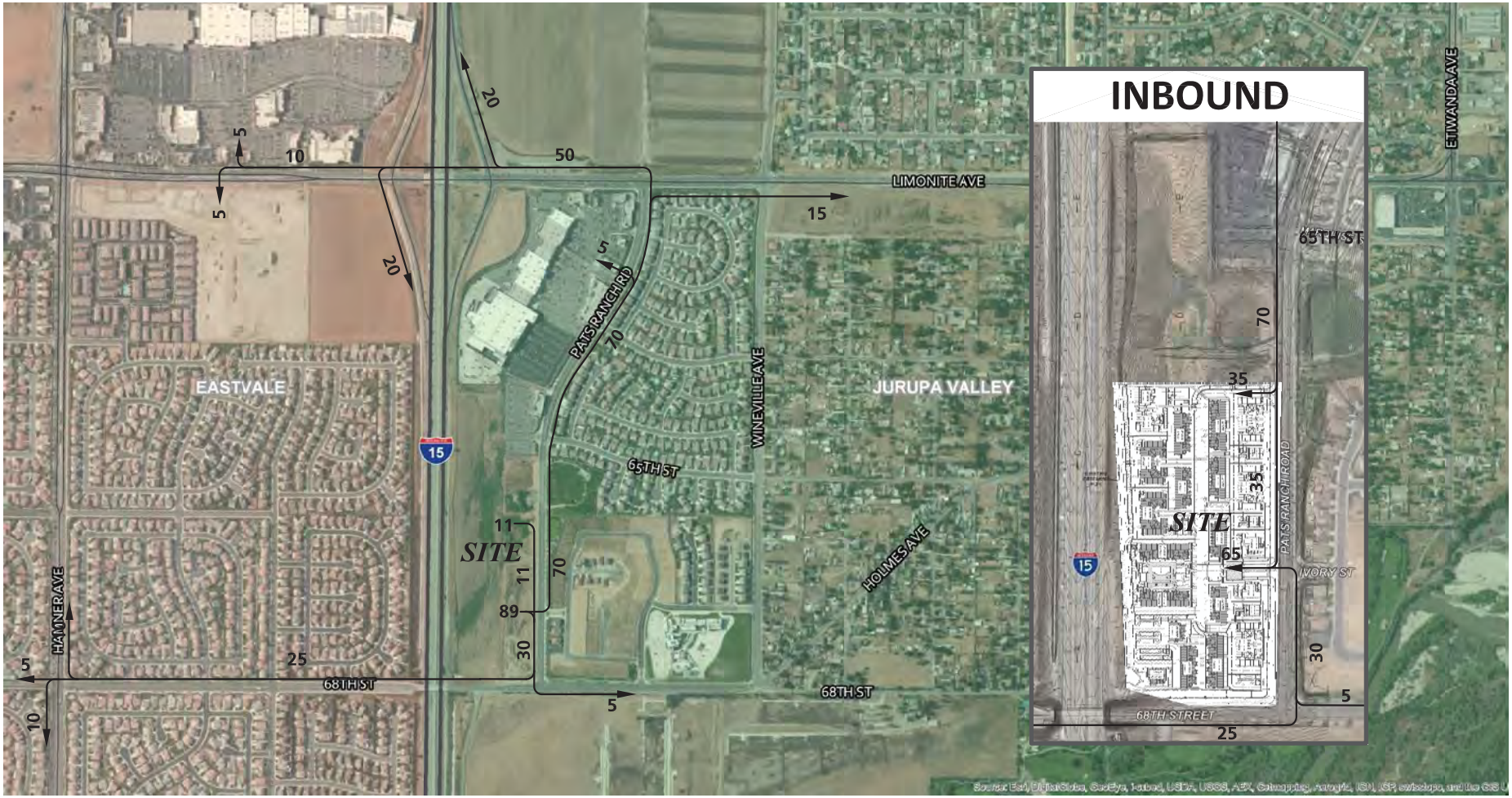
Project Trip Generation Summary

Land Use	Quantity	Units[2]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Vernola Marketplace Apartments	397	DU	40	163	202	159	87	246	2,640

[1] Source: ITE (Institute of Transportation Engineers) Trip Generation Manual, 9th Edition, 2012.

[2] DU = Dwelling Units

EXHIBIT 4-1: PROJECT TRIP DISTRIBUTION



LEGEND:

10 = PERCENT TO/FROM PROJECT

N

AM peak hour trips and 12 PM peak hour trips. 5 percent of the Project trips account for approximately 4 percent of the AM peak hour trips and less than 3 percent of the PM peak hour trips associated with the only the Lowes (opens at 6:00 AM) and Fitness 19 (opens at 4:30 AM) located in the Vernola Marketplace shopping center. Similarly, 5 percent of the Project trips account for less than 2 percent of the AM peak hour trips and less than 1 percent of the PM peak hour trips associated with the Vons (opens at 5:00 AM), Home Depot (opens at 6:00 AM), and Target (opens at 8:00 AM) located in the Eastvale Gateway North shopping Center. Lastly, 5 percent of the Project trips account for approximately 4 percent of the AM peak hour trips and 3 percent of the PM peak hour trips associated with the San Antonio Medical Office (assumed to be open by 8:00 AM) and 24-Hour Fitness (open 24-hours) located in the Eastvale Gateway South shopping center. Although the San Antonio Medical Office has not yet opened, it is anticipated to be open in early 2015 (before the Project's anticipated opening year of 2016).

4.3 MODAL SPLIT

The traffic reducing potential of public transit, walking or bicycling have not been considered in this TIA. Essentially, the traffic projections are "conservative" in that these alternative travel modes might be able to reduce the forecasted traffic volumes.

4.4 PROJECT TRIP ASSIGNMENT

The assignment of traffic from the Project area to the adjoining roadway system is based upon the Project trip generation, trip distribution, and the arterial highway and local street system improvements that would be in place by the time of initial occupancy of the Project. Based on the identified Project traffic generation and trip distribution patterns, Project ADT and peak hour intersection turning movement volumes are shown on Exhibit 4-2.

4.5 CONSTRUCTION TRAFFIC

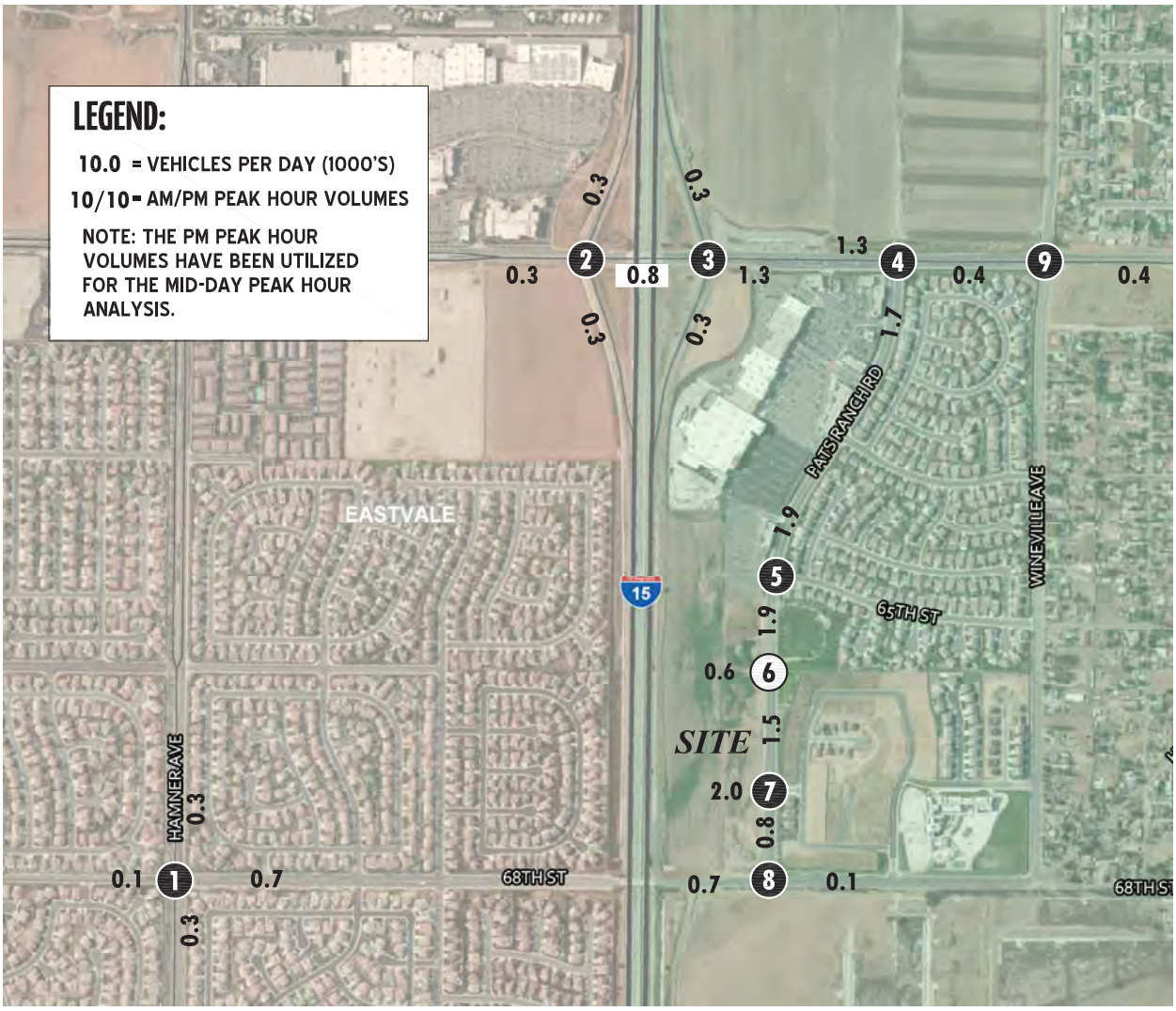
Traffic operations during the proposed construction phase of the project may potentially result in traffic deficiencies related to construction employees, export of materials, and import of construction materials, etc. It is anticipated that the following construction-related activities would generate traffic and may potentially result in construction-related traffic deficiencies:

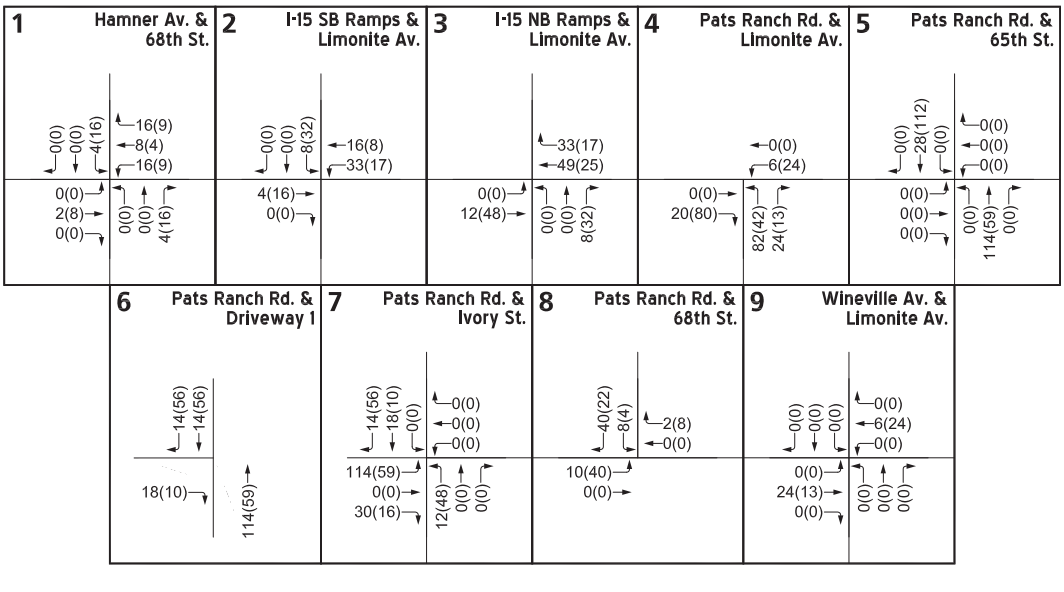
- Employee trips
- Import of construction materials
- Use of heavy equipment

Each of the traffic generating activities listed above is discussed thoroughly in the subsequent sections. It has been assumed that construction activity will occur during the hours of 6:00 AM and 4:00 PM.

The Applicant would be required to develop and implement a City-approved Construction Traffic Management Plan addressing potential construction-related traffic detours and disruptions. In general, the Construction Traffic Management Plan would ensure that to the extent practical, construction traffic would access the Project site during off-peak hours; and that construction traffic would be routed to avoid travel through, or proximate to, sensitive land uses.

EXHIBIT 4-2: PROJECT VOLUMES





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4.5.1 EMPLOYEE TRIPS

Employee trips are estimated based on the number of employees anticipated to be on-site throughout the various stages of construction. Each employee is assumed to drive to and from the construction site each day. It has been assumed that employees will arrive up to 30 minutes prior to the workday and will leave up to 30 minutes after the workday ends. Initially, parking for employees and non-employee vehicles can be accommodated on-site near the construction staging area. Once the internal roadway network is constructed, employee parking can be accommodated curbside on-site.

It is anticipated that the majority of employees would arrive and depart from the site during peak commute traffic periods (i.e., 7:00 AM – 9:00 AM and 4:00 PM – 6:00 PM) with a period of overlap. Employee trips are based on the number of employees estimated to be on site during different points throughout the project. The potential impacts resulting from construction-related parking and employee trips are considered less-than-significant.

It is anticipated that that up to 72 worker trips and 12 vendor trips would occur per day during the construction phase. These trips represent two-way daily trips, or one trip inbound and one trip outbound. Conservatively assuming that all inbound trips occur in the morning and all outbound trips occur in the evening, a total of 42 inbound and 42 outbound trips are estimated (i.e., 72/2 + 12/2). However, this is a conservative estimate as vendor trips are likely to occur throughout the day as opposed to during the morning and evening commute periods.

4.5.2 IMPORT OF CONSTRUCTION MATERIALS

There will also be import of construction materials to and from the site. Import of construction materials is anticipated to consist of the importation of raw building materials, building pad, concrete, parking lot base, asphalt, concrete masonry unit, pipes, landscaping, road base, building equipment, steel, roofing, etc.

In order to minimize the impact of construction truck traffic to the surrounding roadway network, it is recommended that trucks utilize the most direct route between the site and the I-15 Freeway via Limonite Avenue. It is recommended that a construction traffic management plan be implemented for the duration of the construction phase. If such measures are imposed, it can be assumed that truck traffic impacts associated with the export of contaminated topsoil could be considered less-than-significant. The Project will need to file a construction traffic plan with the City and obtain a haul route permit for the import of fill material for the site.

4.5.3 USE OF HEAVY EQUIPMENT

Heavy equipment to be utilized on-site during construction include, but is not limited to: flat beds, dozers, scrapers, graders, track hoes, dump trucks, forklifts, cranes, cement trucks, pavers, rollers, water trucks, rolling container trucks and bobcats. Heavy equipment will be delivered and removed from the site throughout the construction phase. As most heavy equipment is typically not an authorized vehicle to be driven on a public roadway, most of the equipment will be delivered and removed from the site via large flatbed trucks. It is anticipated that delivery of heavy equipment would not occur on a daily basis, but rather periodically throughout the construction phase based on need.

The delivery and removal of heavy equipment is recommended to occur outside of the morning and evening peak hours in order to have nominal impacts to traffic and circulation near the vicinity of the Project. If this measure is applied, it is anticipated that traffic impacts associated with the delivery and removal of heavy equipment are less-than-significant.

4.6 BACKGROUND TRAFFIC

Future year traffic forecasts have been based upon a background (ambient) growth factor of 2% per year. The ambient growth factor is intended to approximate regional traffic growth. The total ambient growth is 4.04% for 2016 traffic conditions (compounded growth of two percent per year over two years or $1.02^{2\ years}$). This ambient growth rate is added to existing traffic volumes to account for area-wide growth not reflected by cumulative development projects. Ambient growth has been added to daily and peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the development of future projects that have been approved but not yet built and/or for which development applications have been filed and are under consideration by governing agencies.

The adopted *Southern California Association of Governments (SCAG) 2012 Regional Transportation Plan (RTP)* (April 2012) growth forecasts for Riverside County identifies projected growth in population of 2,128,000 in 2008 to 3,324,000 in 2035, or a 56.2% increase over the 27 year period. The change in population equates to roughly a 1.67 percent growth rate compounded annually. Similarly, growth over the same 27 year period in households is projected to increase by 60.8 percent, or 1.78 percent annual growth rate. Finally, growth in employment over the same 27 year period is projected to increase by 87.2 percent, or a 2.35 percent annual growth rate. (6) Therefore, the annual growth rate of 2% in conjunction with cumulative project traffic would appear to be conservative and tend to overstate as opposed to understate traffic impacts.

4.7 CUMULATIVE DEVELOPMENT TRAFFIC

CEQA guidelines require that other reasonably foreseeable development projects which are either approved or being processed concurrently in the study area also be included as part of a cumulative analysis scenario. A cumulative project list was developed for the purposes of this analysis through consultation with planning and engineering staff from the City of Jurupa Valley. The neighboring jurisdictions of Chino, Ontario, Corona, Norco, Eastvale, and County of Riverside have also been contacted to include key projects in their respective cities.

Exhibit 4-3 illustrates the cumulative development location map. A summary of cumulative development projects and their proposed land uses are shown on Table 4-2. If applicable, the traffic generated by individual cumulative projects was manually added to the Opening Year Cumulative forecasts to ensure that traffic generated by the listed cumulative development projects in Table 4-2 are reflected as part of the background traffic.

EXHIBIT 4-3: CUMULATIVE DEVELOPMENT PROJECTS LOCATION MAP

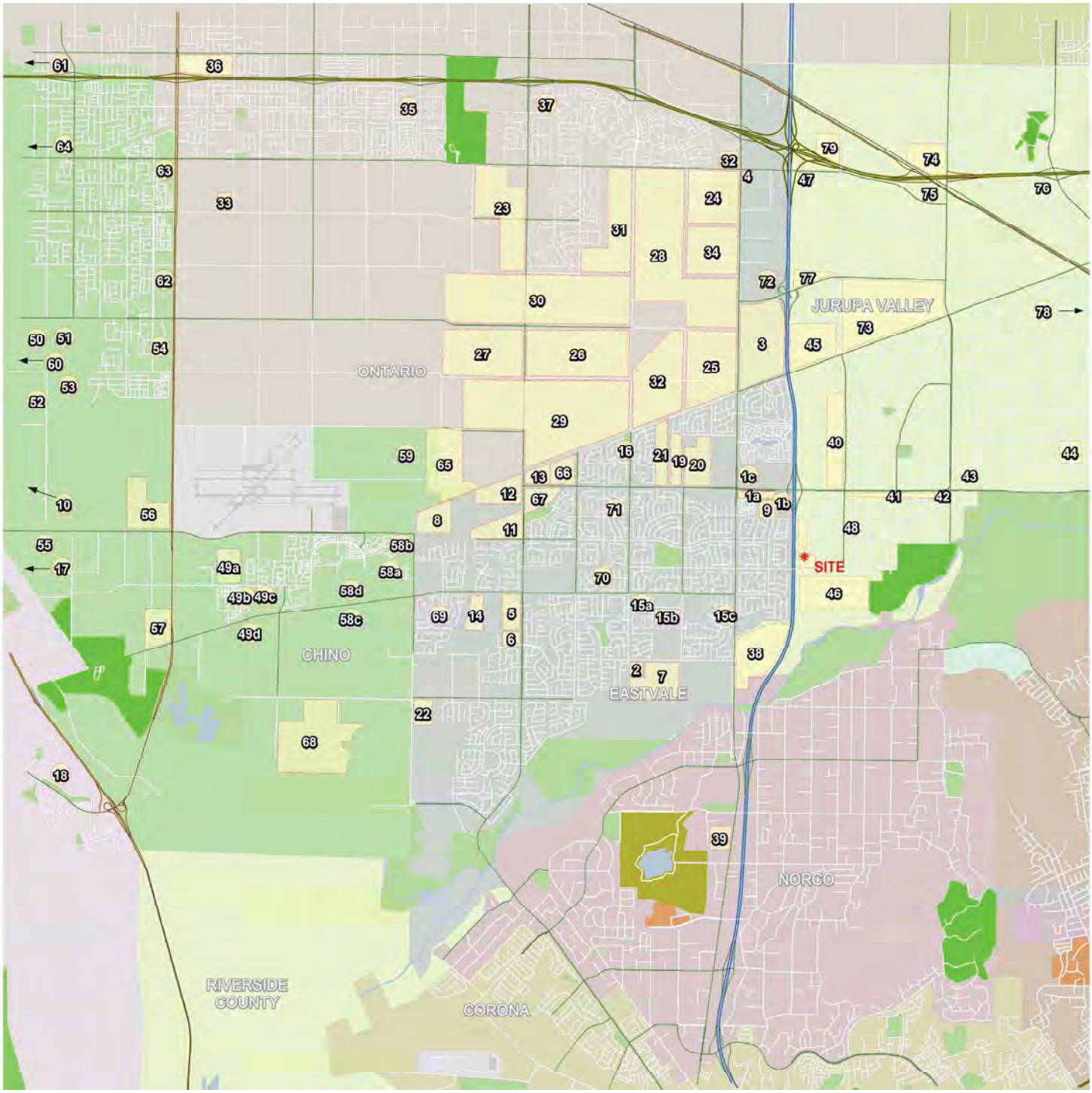

Table 4-2

Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
1A	Eastvale Gateway South	Shopping Center	20.132	TSF
1B	14-0046 - Kasbergen/William Lyons Homes	Condo/Townhouse	220	DU
1C	14-0032 - Tio's Mexican Restaurant	High-Turnover (Sit-Down) Restaurant	2.411	TSF
2	10-0117 (TM36373)	SFDR	51	DU
3	10-0271 - Goodman Commerce Center (Phase 1 and 2)	Shopping Center	249.000	TSF
		Hotel	130	RM
		High Cube Warehouse	3,100.000	TSF
		Business Park	610.000	TSF
4	11-0354 - Arco Gas Station	Gas Station w/ convenience store and car wash	18.000	VFP
		Fast-Food w/o Drive-Thru	2.800	TSF
		Fast-Food with Drive-Thru	2.100	TSF
5	The Marketplace at Enclave	Coffee/Donut Shop w/ Drive Thru	1.600	TSF
		Shopping Center	82.671	TSF
6	TR30896	SFDR	73	DU
7	11-0363 TTM 36382 (Altfillisch Residential Project[5])	SFDR	146	DU
8	SP00358 - The Ranch at Eastvale	Shopping Center	267.200	TSF
		General Light Industrial	801.500	TSF
		Business Park	1,121.100	TSF
9	11-0366 - Eastvale South[3]	Medical-Dental Office Building	70.000	TSF
10	Country Club Villas	Condo/Townhouse	46	DU
	Lago Los Serranos	Condo/Townhouse	95	DU
	The Commons	Shopping Center	150.000	DU
11	13-0395- 65th Street Residential (Copper Sky)	SFDR	250	DU
12	PP23219 (PM35865)	General Light Industrial	738.430	TSF
13	TR32797	SFDR	119	DU
14	TR35751	Condo/Townhouse	243	DU
15A	13-0632 - Sumner Residential (Stratham Homes)	SFDR	129	DU
15B	11-0558 - TR34014 (The Trails)	SFDR	224	DU
15C	13-1601 - 99 Cent Store	Discount Store		TSF
16	CUP 03482	Shopping Center	75.759	TSF
17	The Golden Triangle	Shopping Center	106.700	TSF
	Heritage Professional Center	Hospital	55.000	TSF
		Medical Office Building	86.952	TSF
		Hotel	120	RM
		Shopping Center	38.848	TSF
		Restaurant	7.200	TSF
	Vista Bella Townhomes	Condo/Townhouse	65	DU
	Higgins Business Park	Business Park	338.682	TSF
		General Office	40.000	TSF
		Specialty Retail	10.000	TSF
		Bank with Drive-Thru	3.000	TSF
		Fast-Food with Drive-Thru	3.000	TSF
		Gas Station w/ convenience store and car wash	10	VFP
18	Vila Borba Specific Plan	SFDR	351	DU
19	TR32821	Condo/Townhouse	350	DU
20	TR32909	SFDR	140	DU
21	10-0124 - TR31252 (The Lodge)	SFDR	205	DU
22	TR29997	SFDR	122	DU
		Shopping Center	124.360	TSF
23	Countryside	SFDR	819	DU

Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
24	Edenglen	SFDR	310	DU
		Multi-Family Attached (Condo)	274	DU
		Shopping Center	217.520	TSF
		Business Park	550.000	TSF
25	Esperanza	SFDR	914	DU
		Multi-Family Attached (Apartments)	496	DU
26	Grand Park	SFDR	484	DU
		Multi-Family Attached (Apartments)	843	DU
27	Parkside	SFDR	437	DU
		Multi-Family Attached (Apartments)	1,510	DU
		Shopping Center	115.000	TSF
28	Rich Haven	SFDR	2,732	DU
		Multi-Family Attached (Condo)	1,524	DU
		Shopping Center	848.200	TSF
29	Subarea 29 & Amendment	SFDR	2,865	DU
		Shopping Center	87.000	TSF
30	The Avenue	SFDR	2,020	DU
		Multi-Family Attached (Apartments)	586	DU
		Shopping Center	250.000	TSF
31	West Haven	SFDR	753	DU
		Shopping Center	87.000	TSF
32	Tuscana Village	SFDR	176	DU
		Shopping Center	26.000	TSF
33	PDEV10-011	SFDR	11	DU
34	PDEV10-008 - Dry Food Storage	Mini-Warehouse	17.000	TSF
35	PDEV06-036 - Phase 3	Shopping Center	28.000	TSF
36	PDEV07-050	Shopping Center	36.324	TSF
37	PDEV08-008	Shopping Center	3.920	TSF
38	Silverlakes Equestrian[6]	Soccer Field	14	Fields
		Soccer Field	10	Fields
		Equestrian Facility	400	Stalls
39	Fairfield Inn Hotel	Hotel	96	RM
		High-Turnover (Sit-Down) Restaurant	10.000	TSF
40	TR33428 (Lennar Homes)	SFDR	338	DU
41	TR33258	SFDR	45	DU
42	CUP03555	Mini-Warehouse	141.460	TSF
43	CUP03488 (Self Storage)	Mini-Warehouse	89.642	TSF
44	TR35655	SFDR	9	DU
45	Thorobred Farms (MA1203; 160-040-014)	General Light Industrial	917.580	TSF
		Business Park	598.510	TSF
		Shopping Center	229.640	TSF
46	Riverbend (TTM No. 36391)	SFDR	468	DU
		Park	8.4	AC
47	Riverside Drive Development (PP24947)	General Light Industrial	167.020	TSF
48	6316 Wineville Av. (Daycare)	Daycare	44	Students
49a	Bickmore Street Residential	SFDR	196	DU
49b	TM 17611	SFDR	21	DU
49c	TM 17612	SFDR	42	DU
49d	Barthelemy Project	SFDR	200	DU

Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
50	PL11-0047	Apartments	135	DU
	TM 18873	Condo/Townhouse	149	DU
	TM 16838-2 PA 7B	SFDR	67	DU
51	TM17898	SFDR	77	DU
	TM 17899	SFDR	66	DU
	PL 13-0435	SFDR	41	DU
52	TM18848	Condo/Townhouse	101	DU
53	TM17891	SFDR	75	DU
54	PL11-0299	General Light Industrial	50.000	TSF
	PL13-0601	SFDR	209	DU
55	PL10-0544	General Light Industrial	303.300	TSF
56	Majestic Airport Center	High-Cube Warehouse	2,890.400	TSF
		Warehousing	180.000	TSF
		Specialty Retail	25.000	TSF
		Pharmacy/Drugstore with Drive-Thru	13.000	TSF
		Fast-Food with Drive-Thru	8.600	TSF
	Chino West Industrial	Warehousing	127.052	TSF
		High-Cube Warehouse	942.325	TSF
57	PM18635	General Light Industrial	99.164	TSF
		High-Cube Warehouse	2,077.594	TSF
58a	TM16420-1	Apartments	799	DU
58b	TM 18890	Condo/Townhouse	94	DU
58c	Lewis Residential	Apartments	800	DU
58d	Falloncrest at the Preserve	SFDR	204	DU
		Condo/Townhouse	786	DU
		Apartments	412	DU
		Shopping Center	77.597	TSF
		General Office	77.597	TSF
59	PM19368 (Chino East Industrial)	General Light Industrial	1,593.500	TSF
60	PL 08-0334	Manufacturing	421.031	TSF
	Hillwood @ Monte Vista Av./Schaefer Av.	Industrial	409.000	TSF
	PL 10-0726	General Office	13.672	TSF
61	TM 18880	SFDR	33	DU
	SEC Philadelphia/Ramona	Shopping Center	27.000	TSF
	Chino Central Residential (PL13-0618)	SFDR	94	DU
	Central and Francis Residential	SFDR	113	DU
	Pipeline and Norton Residential	SFDR	45	DU
62	Brewart Residential	SFDR	127	DU
63	Fern and Riverside Residential	SFDR	94	DU
64	Chino Riverside Residential	SFDR	59	DU
	Borba Chino Residential	SFDR	84	DU
65	Watson Commerce Center	High-Cube Warehouse	3,706.740	TSF
66	SC Limonite, LLC	SFDR	318	DU
67	Eastvale Walmart	Free-Standing Discount Superstore	192.000	TSF
		Specialty Retail	9.200	TSF
		Fast-Food Without Drive-Thru	7.200	TSF
		Coffee/Donut Shop w/ Drive Thru	2.000	TSF
		Fast-Food with Drive-Thru	3.500	TSF
		Gas Station w/ convenience store and car wash	16	VFP

Table 4-2

Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
68	Edgewater Communities	SFDR	415	DU
		Condo/Townhouse	659	DU
		Museum/Retail	6.500	TSF
		Church	15.200	TSF
		Park	15.0	AC
69	14-0081 - LFDC Large Family Day Care (Itsy Bitsy Depot)	Daycare	14	Students
70	14-0631 - LFDC Large Family Day Care (Eaton Family Day Care)	Daycare	14	Students
71	14-0783 - LFDC Large Family Day Care (Ling Family Day Care)	Daycare	14	Students
72	14-1077 - Grainger Site (APN:156-050-025, 156-050-026, 156-020-027)	Industrial	546.000	TSF
73	TR36692	SFDR	176	DU
	TR31768	SFDR	189	DU
	TR31778-1	SFDR	128	DU
	TR33461	SFDR	203	DU
	TR31644	SFDR	425	DU
74	PP23203	Industrial/Business Park	821.770	TSF
75	PP23390	Warehousing	78.310	TSF
76	PP23580	Fast-Food with Drive-Thru	1.832	TSF
77	PP24596	Warehousing	122.590	TSF
78	Galena Business Park (SDP31204)	General Light Industrial	173.390	TSF
79	Swift Transportation (ST00934)	General Office	8.000	TSF

[1] SFDR = Single Family Detached Residential

[2] TSF = Ten Thousand Square Feet; DU = Dwelling Unit; VFP = Vehicle Fueling Position; AC = Acres

[3] Source: Eastvale South Trip Generation Analysis, Albert A. Webb Associates, May 27, 2011

[4] Source: Trip Generation Comparison for Cloverdale Marketplace, Phase II, Eastvale CA, Albert A. Webb Associates, August 15, 2011.

[5] Source: Altfillisch Residential Project TIA Memorandum, LSA Associates, Inc., July 25, 2011.

[6] Source: From Silverlakes TIA (Revised), Kunzman Associates, September 25, 2008.

4.8 TRAFFIC FORECASTS

To provide a comprehensive assessment of the deficiencies, two types of analyses, "buildup" and "buildout", were performed in support of this work effort. The "buildup" method was used to approximate E+P, EAP, and EAPC traffic conditions, and is intended to identify the near-term deficiencies on both the existing and planned near-term circulation system. The EAPC traffic condition includes background traffic, traffic generated by other cumulative development projects within the study area, and traffic generated by the proposed Project. The "buildout" approach is used to forecast the Horizon Year Without and With Project conditions of the study area.

4.9 NEAR-TERM CONDITIONS

The "buildup" approach combines existing traffic counts with a background ambient growth factor to forecast the EAP (2016) and EAPC (2016) traffic conditions. An ambient growth factor of 4.04% accounts for background (area-wide) traffic increases that occur over time up to the year 2016 from the year 2014 (compounded two percent per year growth over a two year period). Project traffic is added to assess EAP (2016) traffic conditions. Traffic volumes generated by cumulative development projects are then added to assess the EAPC (2016) traffic conditions. The 2016 roadway network is similar to the existing conditions roadway network with the exception of future roadways and intersections proposed to be developed by the Project.

The near-term traffic analysis includes the following traffic conditions, with the various traffic components:

- EAP (2016)
    - Existing 2014 counts
    - Ambient growth traffic (4.04%)
    - Project traffic
- EAPC (2016)
    - Existing 2014 counts
    - Ambient growth traffic (4.04%)
    - Cumulative Development Project traffic
    - Project traffic

4.10 HORIZON YEAR (2035) CONDITIONS

Traffic projections for Horizon Year conditions were derived from the Riverside County Transportation Analysis Model (RivTAM) using accepted procedures for model forecast refinement and smoothing. The traffic forecasts reflect the area-wide growth anticipated between Existing conditions, and Horizon Year conditions. In most instances the traffic model zone structure is not designed to provide accurate turning movements along arterial roadways unless refinement and reasonableness checking is performed. Therefore, the Horizon Year peak hour forecasts were refined using the model derived long-range forecasts, base (validation) year model forecasts, along with existing peak hour traffic count data collected at each analysis location in May 2014. The refined future peak hour approach and departure volumes

obtained from these calculations are then entered into a spreadsheet program consistent with the National Cooperative Highway Research Program (NCHRP Report 255), along with initial estimates of turning movement proportions. A linear programming algorithm is used to calculate individual turning movements which match the known directional roadway segment forecast volumes computed in the previous step. This program computes a likely set of intersection turning movements from intersection approach counts and the initial turning proportions from each approach leg.

Future estimated peak hour traffic data was used for new intersections and intersections with an anticipated change in travel patterns to further refine the Horizon Year peak hour forecasts. Lastly, Horizon Year turning volumes were compared to EAPC volumes in order to ensure a minimum growth as a part of the refinement process. The minimum growth includes any additional growth between EAPC and Horizon Year traffic conditions that is not accounted for by the traffic generated by cumulative development projects and ambient growth rates assumed between Existing and EAPC conditions.

The future Horizon Year peak hour turning movements were then reviewed by Urban Crossroads for reasonableness, and in some cases, were adjusted to achieve flow conservation, reasonable growth, and reasonable diversion between parallel routes. Flow conservation checks ensure that traffic flow between two closely spaced intersections, such as two freeway ramp locations, is verified in order to make certain that vehicles leaving one intersection are entering the adjacent intersection and that there are no unexplained loss of vehicles. The result of this traffic forecasting procedure is a series of traffic volumes which are suitable for traffic operations analysis.

As noted previously, the traffic analysis in this report considers weekday Mid-day peak hour traffic conditions in addition to the weekday AM and weekday PM peak hours. Therefore, factors were applied to the weekday PM peak hour Horizon Year traffic forecasts to the weekday Mid-day Existing turning volumes to estimate weekday Mid-day peak hour Horizon Year traffic forecasts since the RivTAM 2035 model only considers weekday peak hour traffic conditions. Based on the volume comparison and evaluation of Existing and Horizon Year traffic forecasts during the PM peak hour, relationships were found to vary between study area intersections. These calculated factors (determined by turning movement) were then applied to the weekday Mid-day Existing peak hour turning volumes to determine Horizon Year turning volumes during the weekday Mid-day peak hour.

Post-processing worksheets for Horizon Year Without and With Project traffic conditions are provided in Appendix "4.1".

The Horizon Year Without and With Project traffic conditions analyses will be utilized to determine if improvements funded through regional transportation mitigation fee programs, such as the City of Jurupa Valley DIF, TUMF, Mira Loma RBBD, or other approved funding mechanism can accommodate the long-range cumulative traffic at the target LOS identified in the County of Riverside General Plan. If the "funded" improvements can provide the target LOS, then the Project's payment into these existing fee programs shall be considered as cumulative mitigation through the conditions of approval.

5 EXISTING PLUS PROJECT TRAFFIC CONDITIONS

This section discusses the traffic forecasts for Existing plus Project (E+P) conditions and the resulting intersection operations and traffic signal warrant analyses.

5.1 ROADWAY IMPROVEMENTS

As shown on Exhibit 5-1, the lane configurations and traffic controls assumed to be in place for E+P conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for E+P conditions only (e.g., intersection and roadway improvements at the Project's frontage and driveways).

5.2 E+P TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus Project traffic. Exhibit 5-2 shows the ADT and weekday AM and PM peak hour volumes which can be expected for E+P traffic conditions. E+P Mid-day volumes are shown on Exhibit 5-3.

5.3 INTERSECTION OPERATIONS ANALYSIS

E+P peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TIA. The intersection analysis results are summarized in Table 5-1, which indicates that the addition of Project traffic is not anticipated to result in any additional LOS deficiencies beyond those previously identified for Existing traffic conditions.

The intersection operations analysis worksheets for E+P traffic conditions are included in Appendix "5.1" of this TIA.

5.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

For E+P conditions, there are no additional intersections are anticipated to meet the daily volume based traffic signal warrants in addition to the intersection previously warranted under Existing conditions (see Appendix "5.2").

5.5 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the southbound and northbound off-ramps at the I-15 Freeway at Limonite Avenue interchange to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-15 Freeway mainline. Queuing analysis findings are presented in Table 5-2 for E+P traffic conditions. Off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline.

EXHIBIT 5-1: E+P NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS

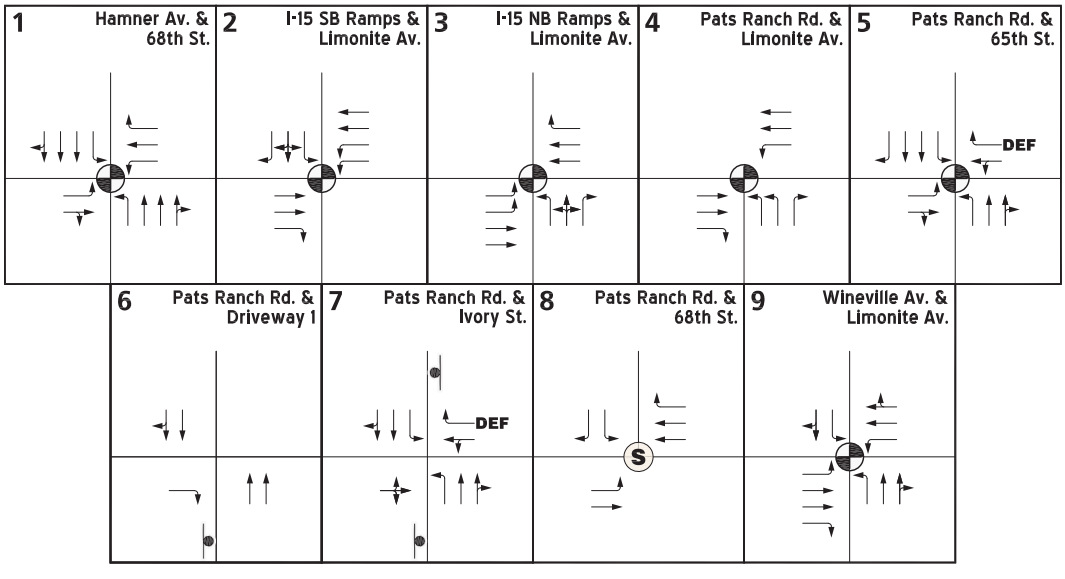

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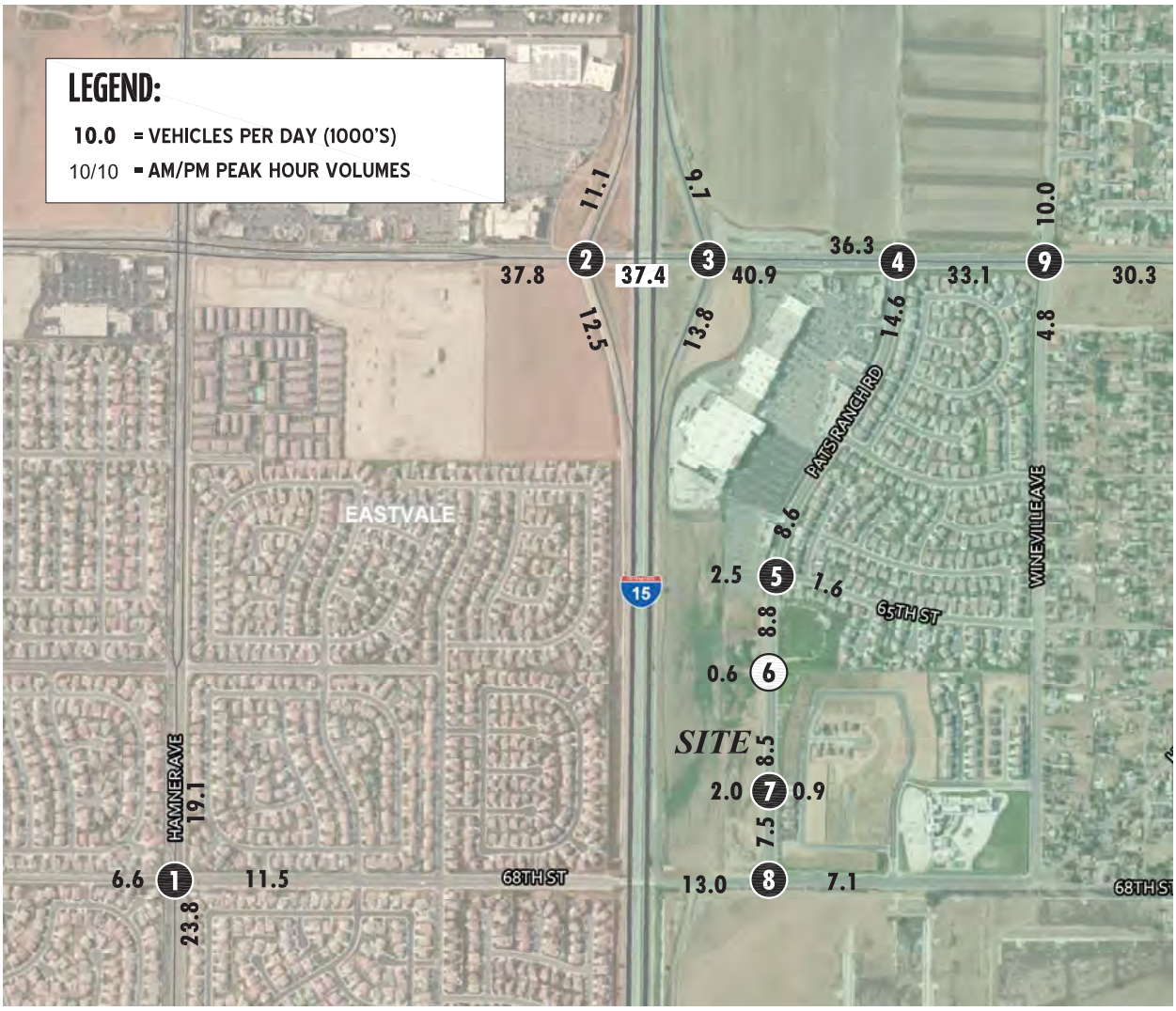
EXHIBIT 5-2: E+P VOLUMES



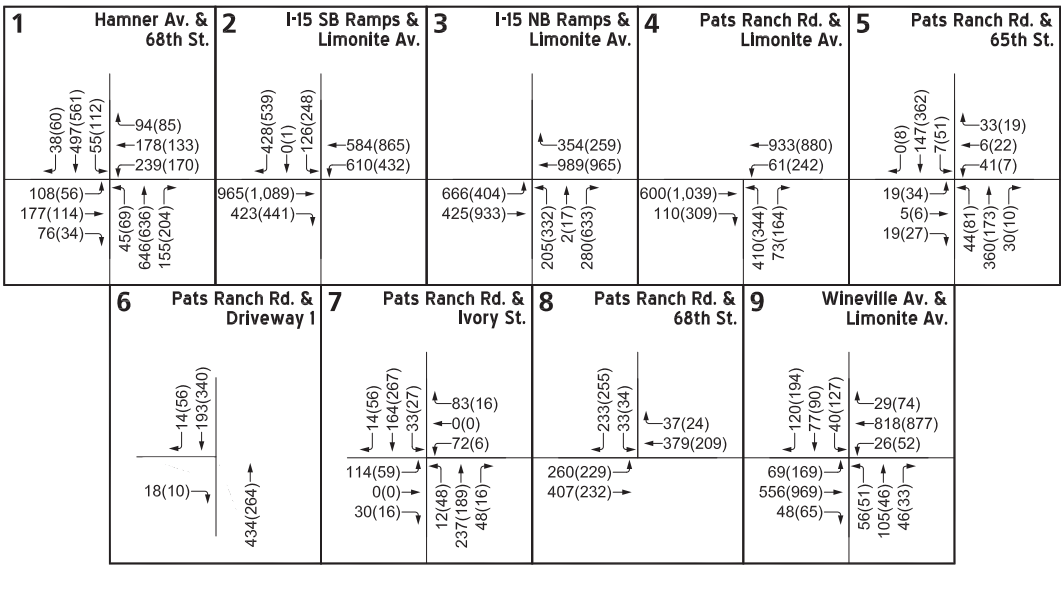
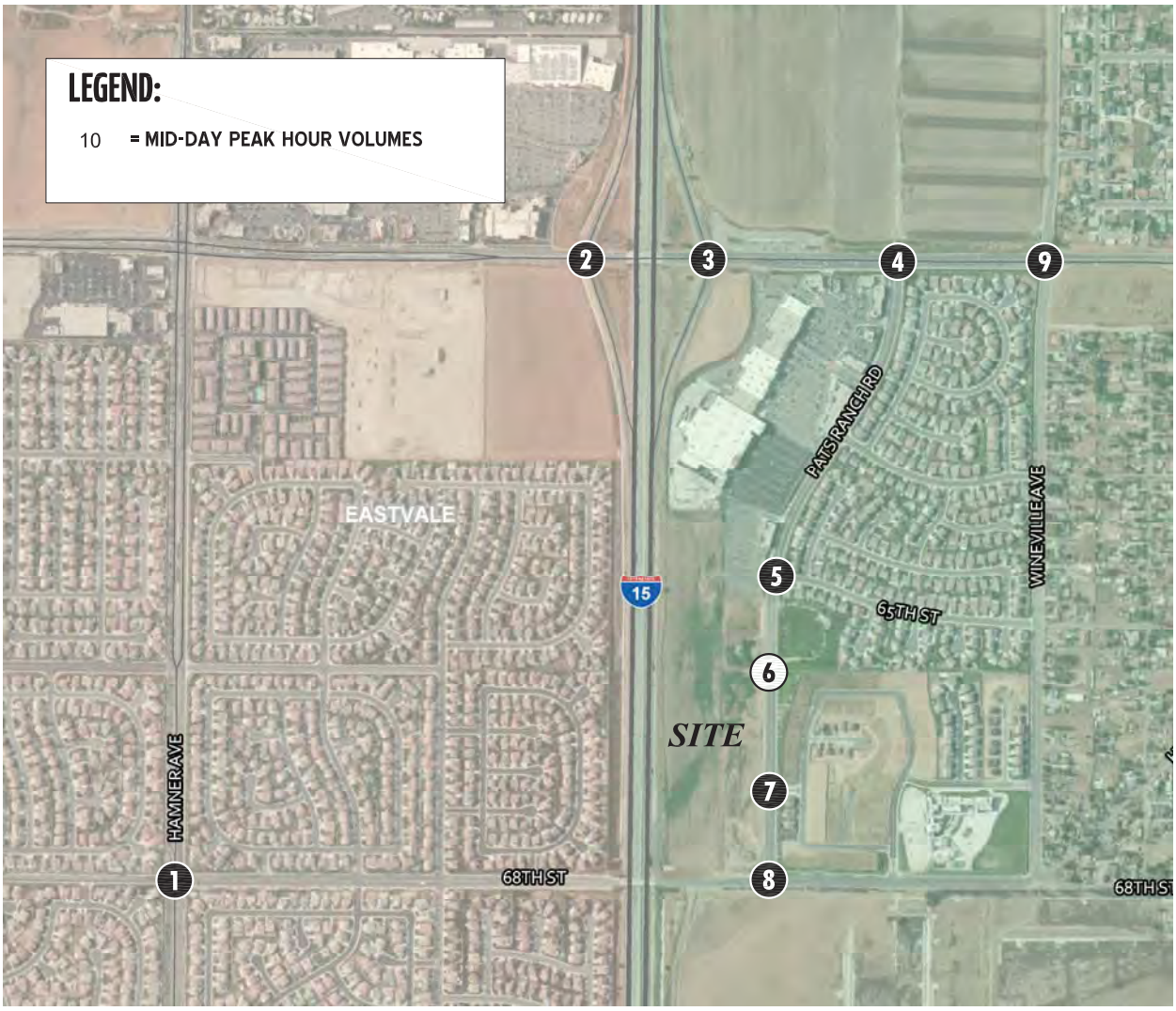
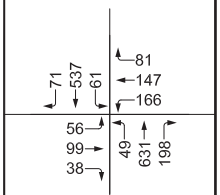


EXHIBIT 5-3: E+P MID-DAY VOLUMES



1 Hamner Av. & 68th St.



2 I-15 SB Ramps & Limonite Av.

Not Analyzed for Mid-Day Peak Hour Conditions

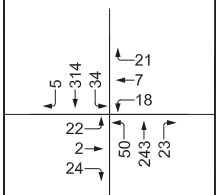
3 I-15 NB Ramps & Limonite Av.

Not Analyzed for Mid-Day Peak Hour Conditions

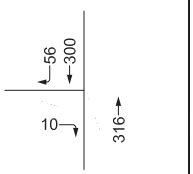
4 Pats Ranch Rd. & Limonite Av.

Not Analyzed for Mid-Day Peak Hour Conditions

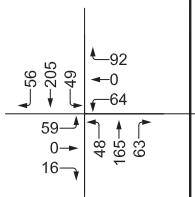
5 Pats Ranch Rd. & 65th St.



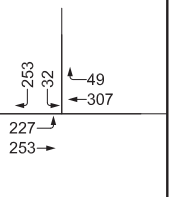
6 Pats Ranch Rd. & Driveway 1



7 Pats Ranch Rd. & Ivory St.



8 Pats Ranch Rd. & 68th St.



9 Wineville Av. & Limonite Av.

Not Analyzed for Mid-Day Peak Hour Conditions

Table 5-1

E+P Conditions Intersection Analysis

#	Intersection	Traffic Control[2]	Existing (2014)						E+P						Acceptable LOS
			Delay [1] (secs.)			Level of Service			Delay [1] (secs.)			Level of Service			
			AM	Mid	PM	AM	Mid	PM	AM	Mid	PM	AM	Mid	PM	
1	Hamner Av. / 68th Street	TS	37.8	28.8	29.7	D	C	C	38.9	30.0	30.6	D	C	C	D
2	I-15 SB Ramps / Limonite Av.	TS	30.2	N/A	33.0	C	N/A	C	30.9	N/A	33.9	C	N/A	C	D
3	I-15 NB Ramps / Limonite Av.	TS	32.7	N/A	37.7	C	N/A	D	33.3	N/A	41.1	C	N/A	D	D
4	Pats Ranch Rd. / Limonite Av.	TS	10.5	N/A	15.1	B	N/A	B	11.9	N/A	17.1	B	N/A	B	D
5	Pats Ranch Rd. / 65th St.	TS	12.5	12.3	15.5	B	B	B	12.5	12.3	15.5	B	B	B	D
6	Pats Ranch Rd. / Driveway 1	**CSS**	--	--	--	--	--	--	9.0	9.5	9.6	A	A	A	D
7	Pats Ranch Rd. / Ivory St.	CSS	16.3	16.4	12.0	C	C	B	18.5	19.5	14.7	C	C	B	D
8	Pats Ranch Rd. / 68th St.	AWS	**48.1**	23.3	13.5	**E**	C	B	**56.0**	28.7	14.8	**F**	D	B	D
9	Wineville Av. / Limonite Av.	TS	22.0	N/A	27.3	C	N/A	C	22.0	N/A	27.3	C	N/A	C	D

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

N/A = Not applicable. Intersection not evaluated during the mid-day peak hour.

[1] Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[2] CSS = Cross-street Stop; AWS = All-Way Stop; TS = Traffic Signal; **CSS** = Improvement

Table 5-2

E+P Conditions Peak Hour Off-Ramp Queuing Analysis

Intersection	Movement	Stacking (Feet)	95th Percentile Stacking Distance Required (Feet)		Acceptable? [1]	
			AM Peak	PM Peak Hour	AM	PM
I-15 SB Off-Ramp / Limonite Av.						
	SBL	400	134	213	Yes	Yes
	SBL/T/R	1,175	229	291	Yes	Yes
	SBR	400	200	262	Yes	Yes
I-15 NB Off-Ramp / Limonite Av.						
	NBL	450	161	253	Yes	Yes
	NBL/T/R	1,290	223	317	Yes	Yes
	NBR	450	181	286	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

As shown on Table 5-2 and consistent with Existing traffic conditions, there are no potential queuing issues anticipated during the weekday AM or weekday PM peak 95th percentile traffic flows for E+P traffic conditions. Worksheets for E+P conditions off-ramp queuing analysis are provided in Appendix "5.3".

5.6 RECOMMENDED IMPROVEMENTS

Improvement strategies have been recommended at intersections that have been identified as deficient to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS "D" or better). The effectiveness of the proposed recommended improvements is presented in Table 5-3 for E+P traffic conditions. Recommended improvements to address deficiencies for E+P traffic conditions are described below. All recommended improvements are consistent with Existing traffic conditions (see Table 3-3).

Recommended Improvement – Pats Ranch Road / 68th Street (#8)

- Project should contribute its fair share towards the installation of a traffic signal and overlap phasing on the southbound right turn lane. *(Improvements are consistent with Existing conditions as shown in Table 3-3).*

The intersection operations analysis worksheets, with improvements, are included in Appendix "5.4" of this TIA for E+P traffic conditions.

Table 5-3

E+P Conditions Intersection Analysis With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)			Level of Service		
			Northbound			Southbound			Eastbound			Westbound								
			L	T	R	L	T	R	L	T	R	L	T	R	AM	Mid	PM	AM	Mid	PM
8	Pats Ranch Rd. / 68th St.																			
	- E+P without Improvements	AWS	0	0	0	1	0	1	1	1	0	0	2	1	**56.0**	28.7	14.8	**F**	D	B
	- E+P with Improvements	**TS**	0	0	0	1	0	**1>**	1	1	0	0	2	1	22.3	20.8	20.7	C	C	C

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; > = Right-Turn Overlap Phasing; **1** = Improvement

[2] Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control.

[3] AWS = All-Way Stop; TS = Traffic Signal

6 EAP TRAFFIC CONDITIONS

This section discusses the traffic forecasts for EAP (2016) conditions and the resulting intersection operations and traffic signal warrant analyses.

6.1 ROADWAY IMPROVEMENTS

As shown on Exhibit 6-1, the lane configurations and traffic controls assumed to be in place for EAP conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for EAP conditions only (e.g., intersection and roadway improvements at the Project's frontage and driveways).

6.2 EAP TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes, 4.04% ambient background growth plus Project traffic. Exhibit 6-2 shows the ADT and weekday AM and PM peak hour volumes which can be expected for EAP (2016) traffic conditions. EAP (2016) Mid-day volumes are shown on Exhibit 6-3.

6.3 INTERSECTION OPERATIONS ANALYSIS

EAP peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TIA. The intersection analysis results are summarized in Table 6-1, which indicates that the addition of Project traffic is not anticipated to result in any additional LOS deficiencies beyond those previously identified for Existing and E+P traffic conditions.

The intersection operations analysis worksheets for EAP (2016) traffic conditions are included in Appendix "6.1" of this TIA.

6.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

For EAP conditions, there are no additional intersections are anticipated to meet the daily volume based traffic signal warrants in addition to the intersection previously warranted under Existing conditions (see Appendix "6.2").

6.5 QUEUING ANALYSIS

Pursuant to the request of City staff, a progression analysis has been performed during the peak hours for EAP (2016) traffic conditions along Limonite Avenue between the I-15 Freeway and Wineville Avenue to determine potential peak hour queues. The queuing analysis performed for the southbound and northbound off-ramps at the I-15 Freeway at Limonite Avenue interchange will determine if vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-15 Freeway mainline.

EXHIBIT 6-1: EAP NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS

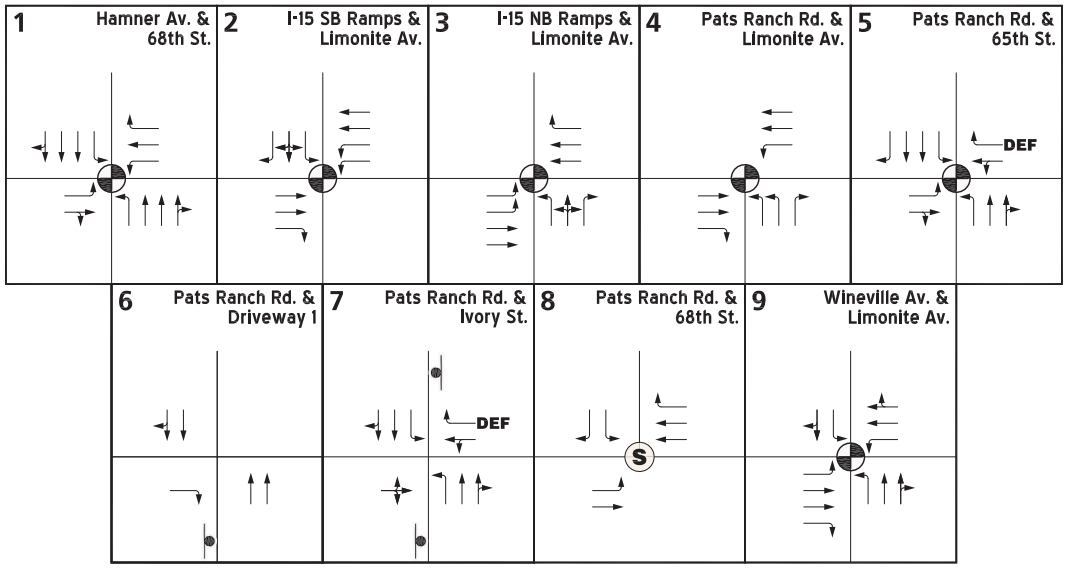
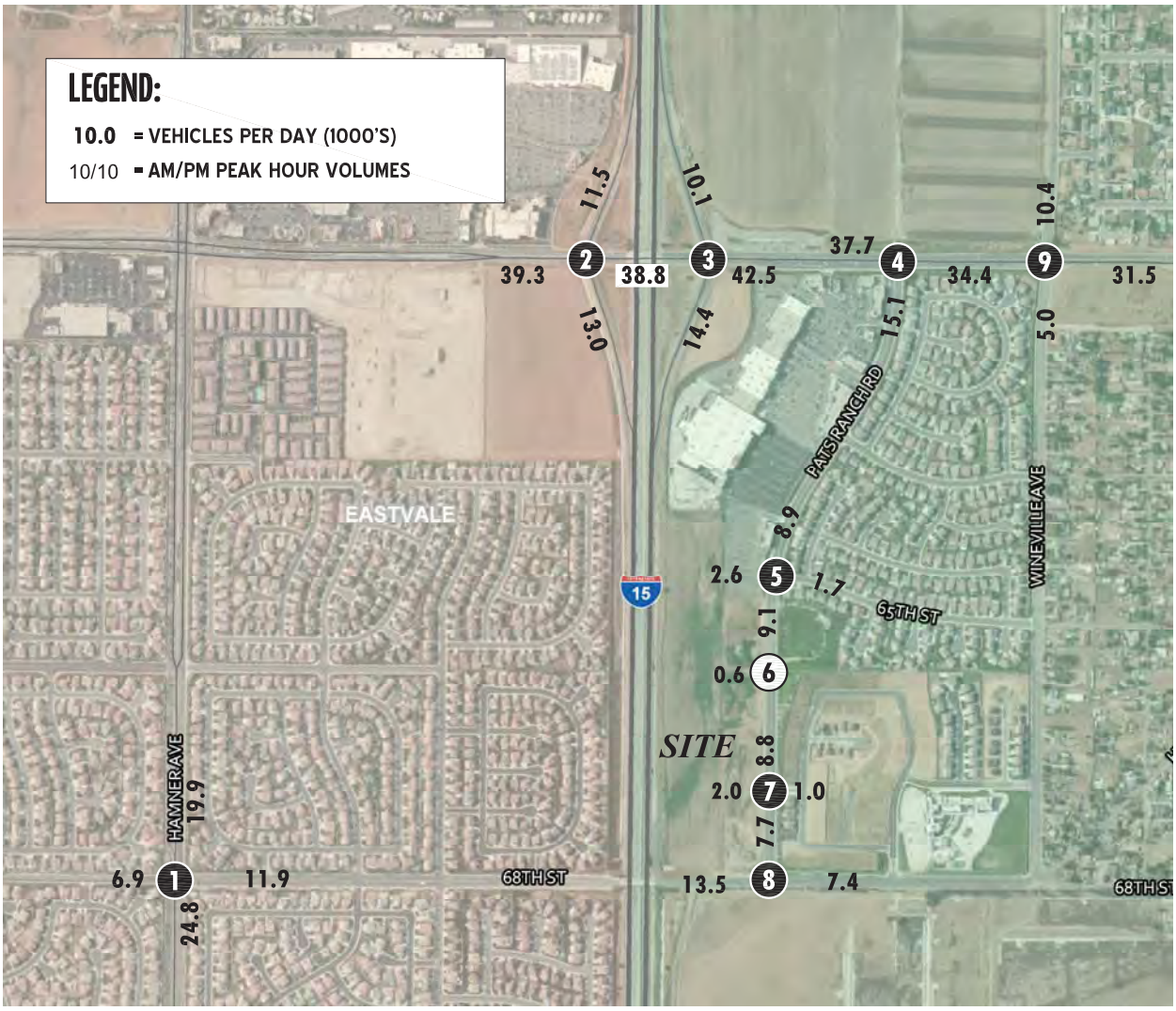


EXHIBIT 6-2: EAP (2016) VOLUMES



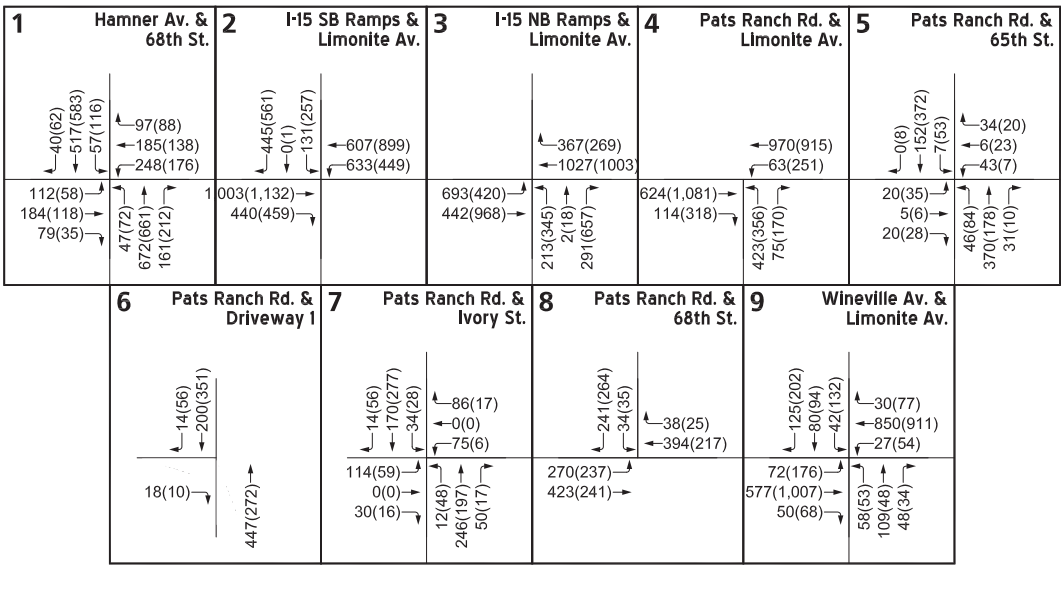
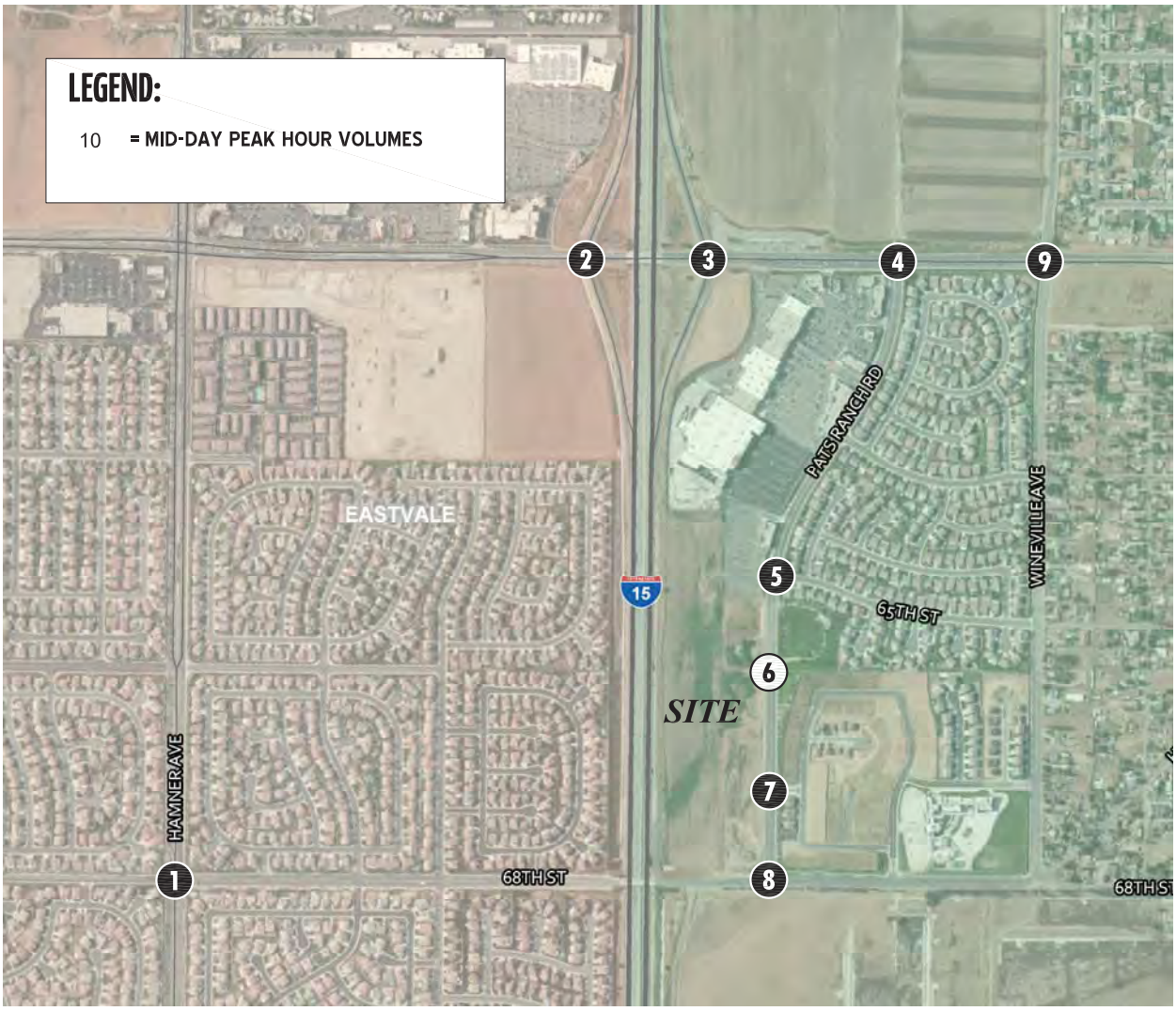


EXHIBIT 6-3: EAP (2016) MID-DAY VOLUMES



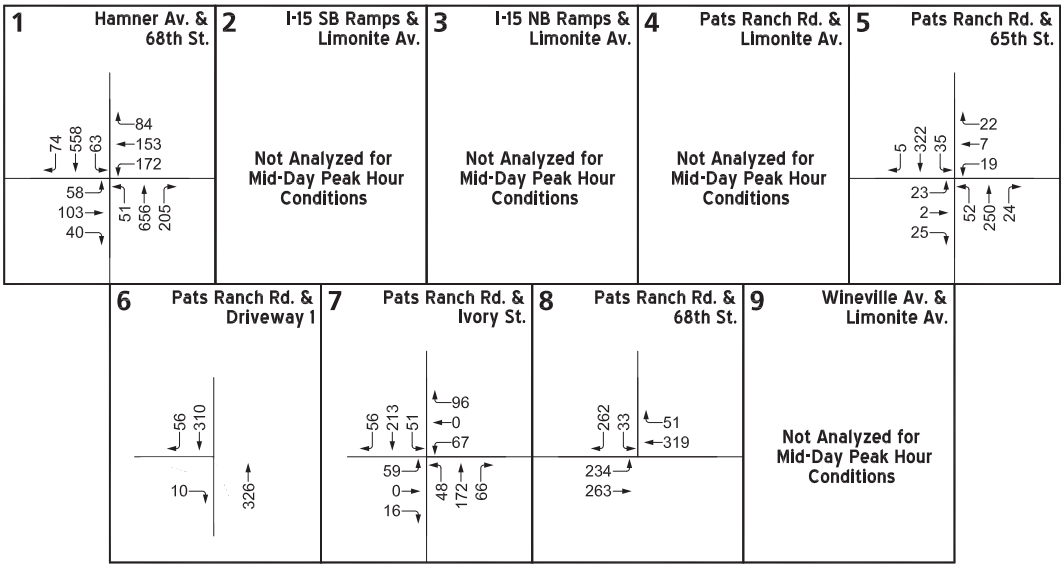


Table 6-1

EAP Conditions Intersection Analysis

#	Intersection	Traffic Control[2]	Existing (2014)						EAP (2016)						Acceptable LOS
			Delay [1] (secs.)			Level of Service			Delay [1] (secs.)			Level of Service			
			AM	Mid	PM	AM	Mid	PM	AM	Mid	PM	AM	Mid	PM	
1	Hamner Av. / 68th Street	TS	37.8	28.8	29.7	D	C	C	39.9	30.5	31.1	D	C	C	D
2	I-15 SB Ramps / Limonite Av.	TS	30.2	N/A	33.0	C	N/A	C	31.4	N/A	35.6	C	N/A	D	D
3	I-15 NB Ramps / Limonite Av.	TS	32.7	N/A	37.7	C	N/A	D	34.3	N/A	44.8	C	N/A	D	D
4	Pats Ranch Rd. / Limonite Av.	TS	10.5	N/A	15.1	B	N/A	B	12.1	N/A	18.1	B	N/A	B	D
5	Pats Ranch Rd. / 65th St.	TS	12.5	12.3	15.5	B	B	B	12.5	12.3	15.5	B	B	B	D
6	Pats Ranch Rd. / Driveway 1	**CSS**	--	--	--	--	--	--	9.0	9.5	9.7	A	A	A	D
7	Pats Ranch Rd. / Ivory St.	CSS	16.3	16.4	12.0	C	C	B	19.1	20.2	14.9	C	C	B	D
8	Pats Ranch Rd. / 68th St.	AWS	**48.1**	23.3	13.5	**E**	C	B	**65.8**	32.9	15.5	**F**	D	C	D
9	Wineville Av. / Limonite Av.	TS	22.0	N/A	27.3	C	N/A	C	22.0	N/A	27.3	C	N/A	C	D

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

N/A = Not applicable. Intersection not evaluated during the mid-day peak hour.

[1] Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[2] CSS = Cross-street Stop; AWS = All-Way Stop; TS = Traffic Signal; **CSS** = Improvement

Table 6-2

EAP Conditions Peak Hour Queuing Analysis

Intersection	Movement	Stacking (Feet)	95th Percentile Stacking Distance Required (Feet)		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM
I-15 SB Off-Ramp / Limonite Av.						
	SBL	400	172	229	Yes	Yes
	SBL/T/R	1,175	261	295	Yes	Yes
	SBR	400	236	261	Yes	Yes
	EBT	1,120	777	442	Yes	Yes
	EBR	1,120	232	214	Yes	Yes
	WBL	275	256	206	Yes	Yes
	WBT	620	72	134	Yes	Yes
I-15 NB Off-Ramp / Limonite Av.						
	NBL	450	222	304	Yes	Yes
	NBL/T/R	1,290	262	355	Yes	Yes
	NBR	450	219	307	Yes	Yes
	EBL	300	285	194	Yes	Yes
	EBT	620	133	239	Yes	Yes
	WBT	1,080	898	319	Yes	Yes
	WBR	635	250	127	Yes	Yes
Pats Ranch Rd. / Limonite Av.						
	EBT	1,080	206	279	Yes	Yes
	EBR	200	62	156	Yes	Yes
	WBL	165	**210**	**249**	**No**	**No**
	WBT	825	603	227	Yes	Yes
Wineville Av. / Limonite Av.						
	EBL	250	86	208	Yes	Yes
	EBT	825	132	208	Yes	Yes
	EBR	360	35	43	Yes	Yes
	WBL	250	113	**295**	Yes	**No**
	WBT	2,480	374	583	Yes	Yes

BOLD = 95th percentile queue is anticipated to exceed the available storage.

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

Queuing analysis findings are presented in Table 6-2 for EAP (2016) traffic conditions. As shown on Table 6-2, the following movements may potentially experience queuing issues during the peak 95th percentile traffic flows under EAP (2016) traffic conditions:

ID	Intersection Location	Movement
4	Pats Ranch Road / Limonite Avenue	- Westbound Left: will not provide adequate storage to accommodate 95th percentile EAP (2016) vehicle queues during the AM and PM peak hours. Could potentially result in vehicles spilling back into the adjacent westbound through lane and may affect peak hour operations at Wineville Avenue. Recommendation is to lengthen the westbound left turn lane to accommodate the 95th percentile queues.
9	Wineville Avenue / Limonite Avenue	- Westbound Left: will not provide adequate storage to accommodate 95th percentile EAP (2016) vehicle queues during the PM peak hour only. Could potentially result in vehicles spilling back into the adjacent westbound through lane. Recommendation is to lengthen the westbound left turn lane to accommodate 95th percentile queues.

The 95th percentile EAP (2016) vehicle queues are anticipated to result in periodic (approximately 5 percent of the time) spill-back towards Wineville Avenue along Limonite Avenue. As such, this queuing issue is anticipated to be less-than-significant. Worksheets for EAP (2016) conditions queuing analysis are provided in Appendix "6.3".

6.6 RECOMMENDED IMPROVEMENTS

Improvement strategies have been recommended at intersections that have been identified as deficient to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS "D" or better). The effectiveness of the proposed recommended improvements is presented in Table 6-3 for EAP (2016) traffic conditions. Recommended improvements to address deficiencies for EAP traffic conditions are described below. All recommended improvements are consistent with Existing and E+P traffic conditions (see Table 3-3 and Table 5-3).

Recommended Improvement – Pats Ranch Road / Limonite Avenue (#4)

- Although not necessary for acceptable peak hour intersection operations, Project should restripe the westbound left turn lane to provide 250-feet of storage to accommodate the 95th percentile peak hour queues.

Recommended Improvement – Pats Ranch Road / 68th Street (#8)

- Project should contribute its fair share towards the installation of a traffic signal and overlap phasing on the southbound right turn lane. *(Improvements are consistent with Existing conditions as shown in Table 3-3).*

Recommended Improvement – Wineville Avenue / Limonite Avenue (#9)

- Although not necessary for acceptable peak hour intersection operations, Project should restripe the westbound left turn lane to provide 300-feet of storage to accommodate the 95th percentile peak hour queues.

The intersection operations analysis worksheets, with improvements, are included in Appendix “6.4” of this TIA for EAP (2016) traffic conditions.

Table 6-3

EAP (2016) Conditions Intersection Analysis With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)			Level of Service		
			Northbound			Southbound			Eastbound			Westbound								
			L	T	R	L	T	R	L	T	R	L	T	R	AM	Mid	PM	AM	Mid	PM
8	Pats Ranch Rd. / 68th St.																			
	- EAP (2016) without Improvements	AWS	0	0	0	1	0	1	1	1	0	0	2	1	**65.8**	32.9	15.5	**F**	D	C
	- EAP (2016) with Improvements	**TS**	0	0	0	1	0	**1>**	1	1	0	0	2	1	22.9	22.4	21.6	C	C	C

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; > = Right-Turn Overlap Phasing; **1** = Improvement

[2] Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control.

[3] AWS = All-Way Stop; TS = Traffic Signal

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7 EAPC TRAFFIC CONDITIONS

This section discusses the methods used to develop EAPC (2016) traffic forecasts, and the resulting intersection operations and traffic signal warrant analyses.

7.1 ROADWAY IMPROVEMENTS

As shown on Exhibit 7-1, the lane configurations and traffic controls assumed to be in place for EAPC conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for EAPC conditions only (e.g., intersection and roadway improvements along the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by nearby cumulative developments to provide site access are also assumed to be in place for EAPC conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways, including but not limited to the extension of Pats Ranch Road to the north for access to Tract 33428 and to the south for access to the Riverbend project).

7.2 EAPC TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes, an ambient growth factor of 4.04% plus traffic from pending and approved but not yet constructed known development projects in the area and the addition of Project traffic. The weekday ADT, weekday AM, and weekday PM peak hour volumes which can be expected for EAPC (2016) traffic conditions are shown on Exhibit 6-2. Exhibit 6-3 shows the EAPC (2016) Mid-day peak hour volumes.

7.3 INTERSECTION OPERATIONS ANALYSIS

LOS calculations were conducted for the study intersections to evaluate their operations under EAPC (2016) conditions with roadway and intersection geometrics consistent with Section 7.1 *Roadway Improvements*. As shown in Table 7-1, the study area intersections are anticipated to operate at acceptable levels of service, with the exception of the following locations:

ID	Intersection Location
2	I-15 Southbound Ramps / Limonite Avenue – LOS "E" AM peak hour; LOS "F" PM peak hour
3	I-15 Northbound Ramps / Limonite Avenue – LOS "E" AM and PM peak hours
8	Pats Ranch Road / 68th Street – LOS "F" AM peak hour; LOS "E" Mid-day peak hour

The intersection operations analysis worksheets for EAPC (2016) traffic conditions are included in Appendix "7.1" of this TIA.

Measures to address near-term deficiencies for EAPC traffic conditions are discussed in Section 7.6 *Near-Term Deficiencies and Recommended Improvements.*

EXHIBIT 7-1: EAPC NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS

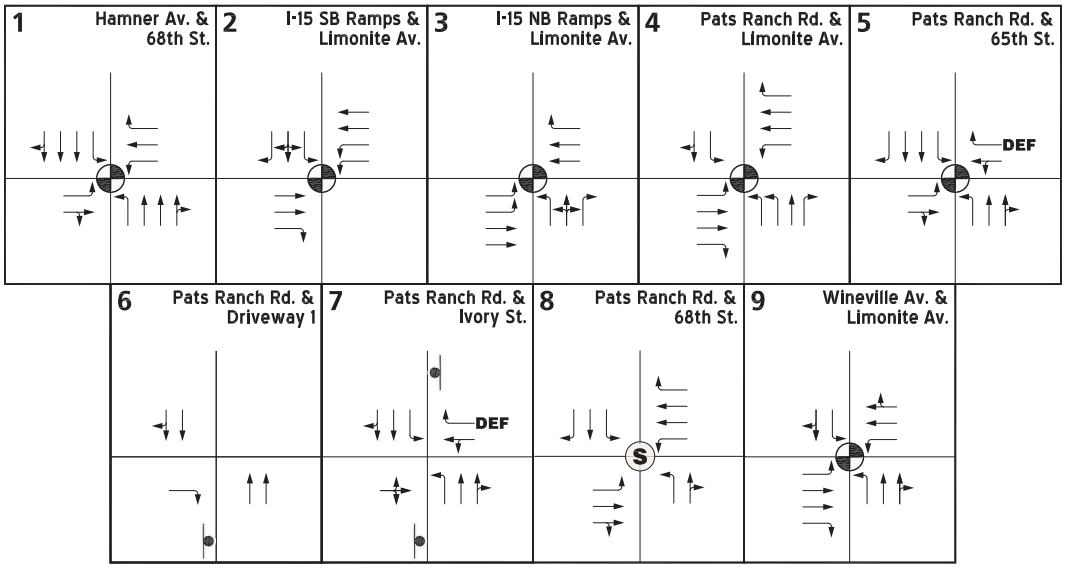

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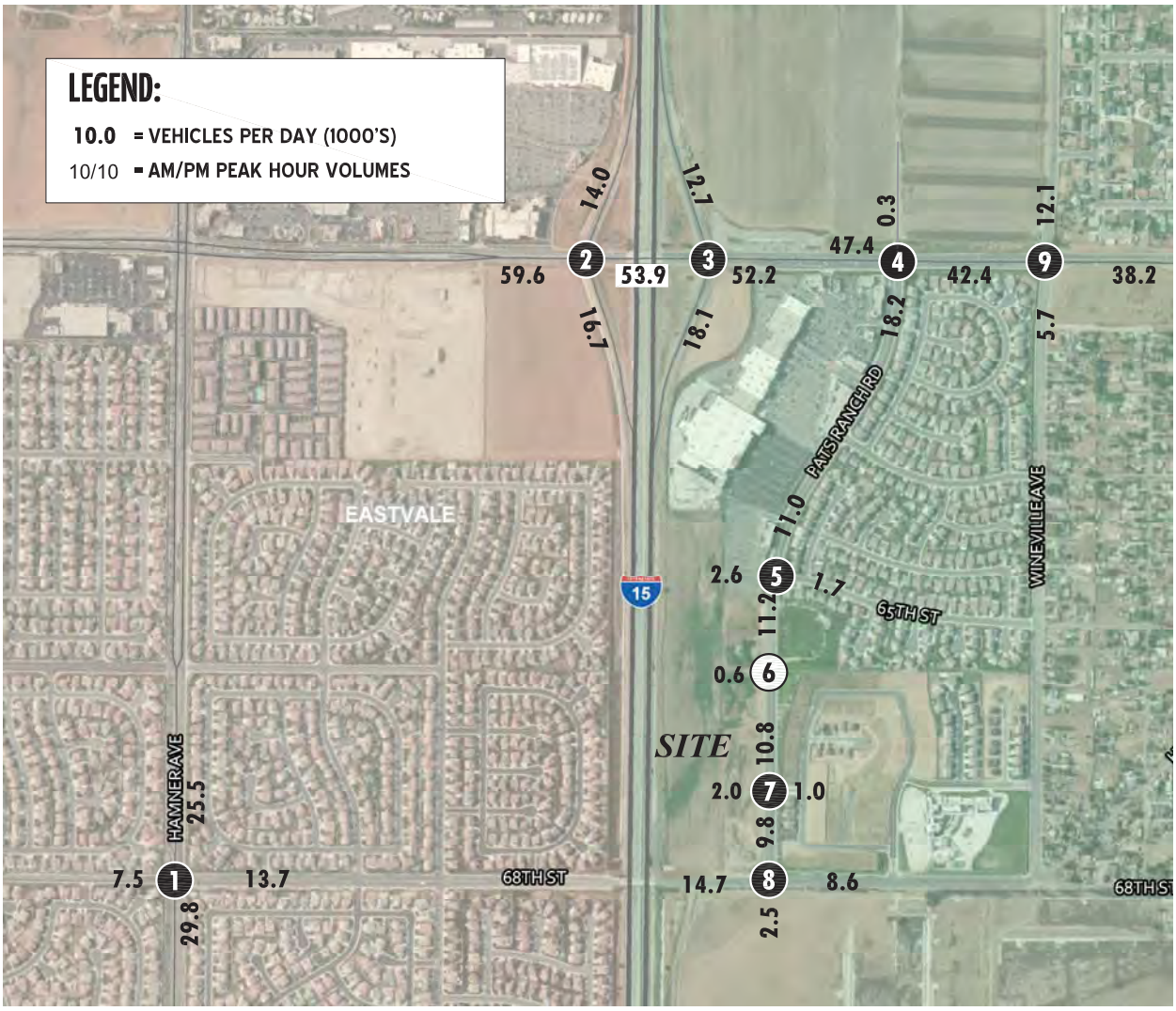
EXHIBIT 7-2: EAPC (2016) VOLUMES



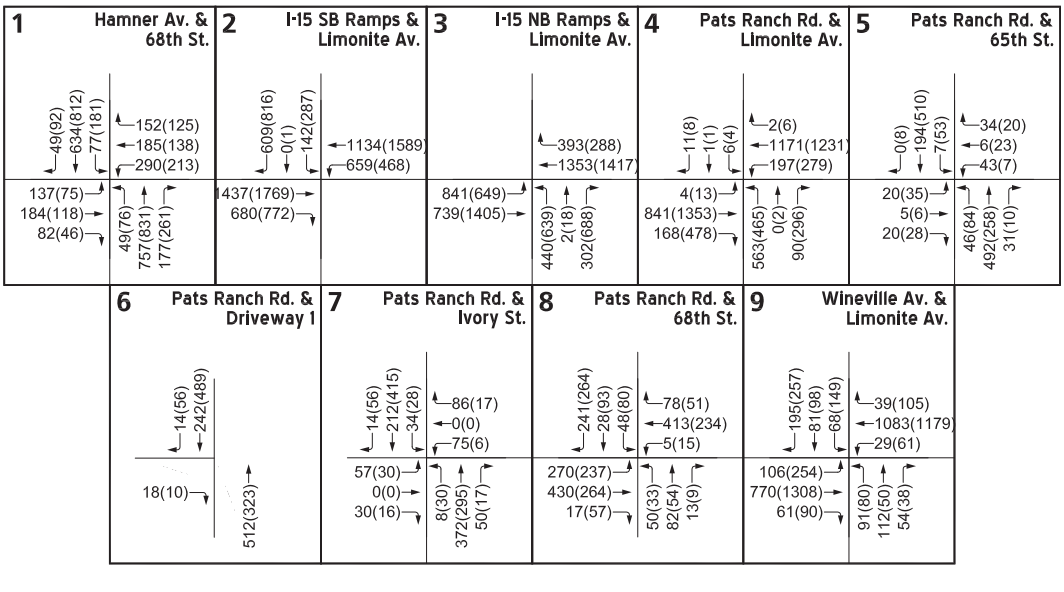
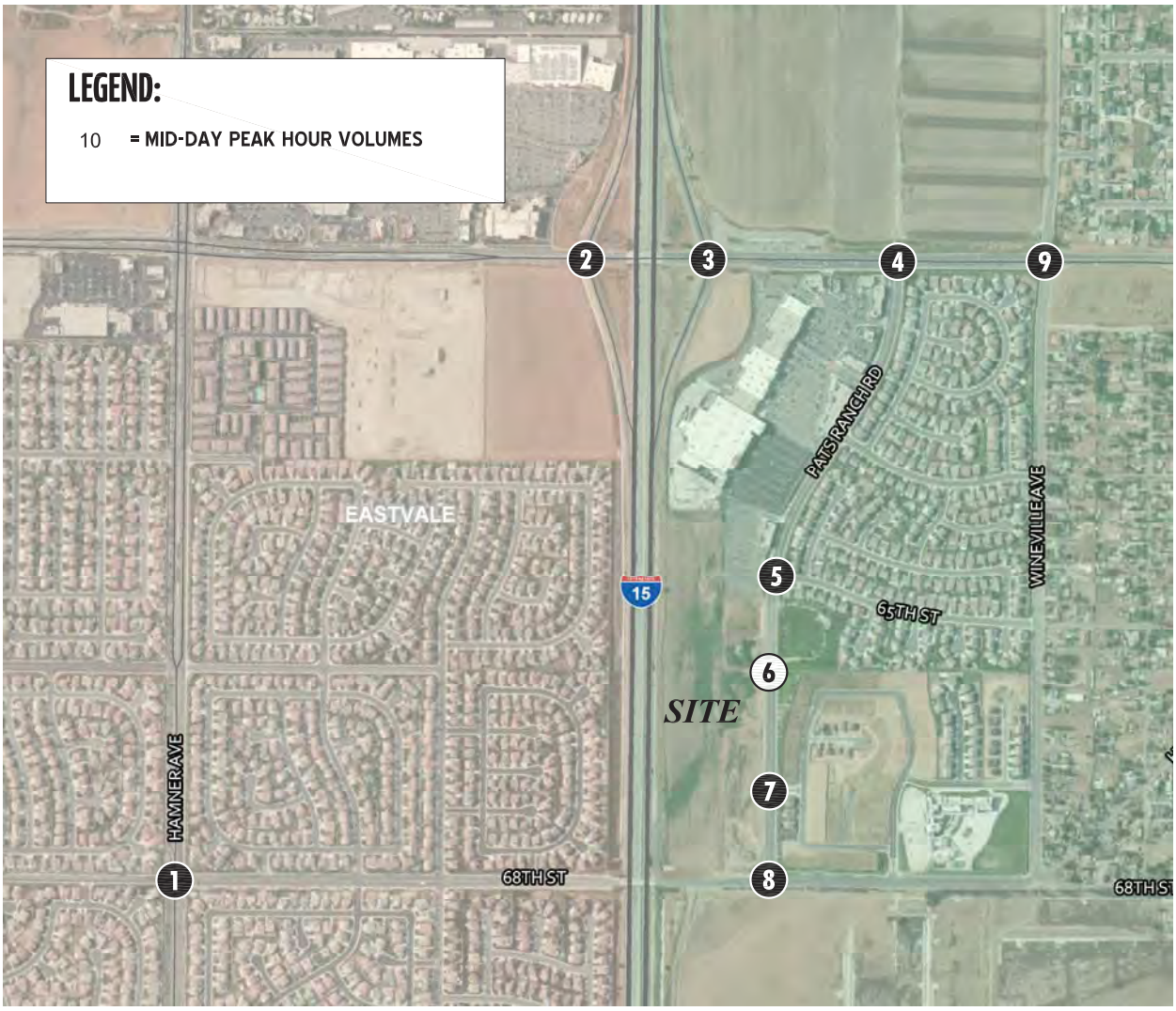


EXHIBIT 7-3: EAPC (2016) MID-DAY VOLUMES



1 Hamner Av. & 68th St.

	104 787 128	121 153 209
75 103 51	55 826 254	

2 I-15 SB Ramps & Limonite Av.

Not Analyzed for Mid-Day Peak Hour Conditions

3 I-15 NB Ramps & Limonite Av.

Not Analyzed for Mid-Day Peak Hour Conditions

4 Pats Ranch Rd. & Limonite Av.

Not Analyzed for Mid-Day Peak Hour Conditions

5 Pats Ranch Rd. & 65th St.

	5 460 35	22 7 19
23 2 25	52 330 24	

6 Pats Ranch Rd. & Driveway 1

	56 448	
10	406	

7 Pats Ranch Rd. & Ivory St.

	56 351 51	96 0 67
59 0 16	48 252 66	

8 Pats Ranch Rd. & 68th St.

	262 93 78	77 336 15
234 286 57	33 54 9	

9 Wineville Av. & Limonite Av.

Not Analyzed for Mid-Day Peak Hour Conditions

N

Table 7-1

EAPC Conditions Intersection Analysis

#	Intersection	Traffic Control[2]	EAPC (2016) Delay [1] (secs.) AM	Mid	PM	EAPC (2016) Level of Service AM	Mid	PM	Acceptable LOS
1	Hamner Av. / 68th Street	TS	46.9	35.3	34.6	D	D	C	D
2	I-15 SB Ramps / Limonite Av.	TS	**59.7**	N/A	**87.0**	**E**	N/A	**F**	D
3	I-15 NB Ramps / Limonite Av.	TS	**71.5**	N/A	**65.1**	**E**	N/A	**E**	D
4	Pats Ranch Rd. / Limonite Av.	TS	26.2	N/A	40.9	C	N/A	D	D
5	Pats Ranch Rd. / 65th St.	TS	12.5	12.3	15.5	B	B	B	D
6	Pats Ranch Rd. / Driveway 1	**CSS**	9.2	10.1	10.2	A	B	B	D
7	Pats Ranch Rd. / Ivory St.	CSS	24.1	28.7	17.7	C	D	C	D
8	Pats Ranch Rd. / 68th St.	AWS	**87.3**	**47.8**	18.4	**F**	**E**	C	D
9	Wineville Av. / Limonite Av.	TS	26.6	N/A	54.4	C	N/A	D	D

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

N/A = Not applicable. Intersection not evaluated during the mid-day peak hour.

[1] Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic sig all-way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[2] CSS = Cross-street Stop; AWS = All-Way Stop; TS = Traffic Signal; **CSS** = Improvement

[3] Delay is theoretically infinite; LOS "F".

7.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

For EAPC conditions, there are no additional intersections are anticipated to meet the daily volume based traffic signal warrants in addition to the intersection previously warranted under Existing conditions (see Appendix "7.3" and Appendix "7.4").

7.5 QUEUING ANALYSIS

Pursuant to the request of City staff, a progression analysis has been performed during the peak hours for EAPC (2016) traffic conditions along Limonite Avenue between the I-15 Freeway and Wineville Avenue to determine potential peak hour queues. The queuing analysis performed for the southbound and northbound off-ramps at the I-15 Freeway at Limonite Avenue interchange will determine if vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-15 Freeway mainline.

Queuing analysis findings are presented in Table 7-2 for EAPC (2016) traffic conditions. As shown on Table 7-2, the following movements may potentially experience queuing issues during the peak 95th percentile traffic flows under EAPC (2016) traffic conditions:

ID	Intersection Location	Movement
2	I-15 Southbound Ramps / Limonite Avenue	- Eastbound Through: will not provide adequate storage to accommodate 95th percentile EAPC (2016) vehicle queues during the AM and PM peak hours. Could potentially result in vehicles spilling back and may affect the peak hour operations at the signalized Eastvale Gateway intersection.
3	I-15 Northbound Ramps / Limonite Avenue	- Northbound Left, Northbound Right: will not provide adequate storage to accommodate 95th percentile EAPC (2016) vehicle queues during the PM peak hour only. Could potentially result in vehicles spilling back into the adjacent northbound through lane. However, these queues are not anticipated to spill back onto the I-15 Freeway mainline. - Westbound Through: will not provide adequate storage to accommodate 95th percentile EAPC (2016) vehicle queues during the AM and PM peak hours. Could potentially result in vehicles spilling back and may affect the peak hour operations at Pats Ranch Road.
4	Pats Ranch Road / Limonite Avenue	- Westbound Left: will not provide adequate storage to accommodate 95th percentile EAPC (2016) vehicle queues during the AM and PM peak hours. Could potentially result in vehicles spilling back into the adjacent westbound through lane and may affect peak hour operations at Wineville Avenue.
9	Wineville Avenue / Limonite Avenue	- Westbound Left: will not provide adequate storage to accommodate 95th percentile EAPC (2016) vehicle queues during the PM peak hour only. Could potentially result in vehicles spilling back into the adjacent westbound through lane.

Worksheets for EAPC (2016) conditions queuing analysis are provided in Appendix "7.3".

Table 7-2

EAPC Conditions Peak Hour Queuing Analysis

Intersection	Movement	Stacking (Feet)	95th Percentile Stacking Distance Required (Feet)		Acceptable?[1]	
			Hour	PM Peak Hour	AM	PM
I-15 SB Off-Ramp / Limonite Av.						
	SBL	400	205	328	Yes	Yes
	SBL/T/R	1,175	284	402	Yes	Yes
	SBR	400	247	366	Yes	Yes
	EBT	1,120	**1,193**	**1,217**	**No**	**No**
	EBR	1,120	395	326	Yes	Yes
	WBL	275	237	177	Yes	Yes
	WBT	620	172	154	Yes	Yes
I-15 NB Off-Ramp / Limonite Av.						
	NBL	450	293	**502**	Yes	**No**
	NBL/T/R	1,290	307	554	Yes	Yes
	NBR	450	269	**510**	Yes	**No**
	EBL	300	273	195	Yes	Yes
	EBT	620	211	255	Yes	Yes
	WBT	1,080	**1,116**	**1,197**	**No**	**No**
	WBR	635	412	437	Yes	Yes
Pats Ranch Rd. / Limonite Av.						
	EBL	200	12	102	Yes	Yes
	EBT	1,080	298	402	Yes	Yes
	EBR	1,080	164	380	Yes	Yes
	WBL	165	**247**	**283**	**No**	**No**
	WBT	825	363	356	Yes	Yes
	WBR	825	5	5	Yes	Yes
Wineville Av. / Limonite Av.						
	EBL	250	133	**406**	Yes	**No**
	EBT	825	303	770	Yes	Yes
	EBR	360	47	33	Yes	Yes
	WBL	250	54	**331**	Yes	**No**
	WBT	2,480	361	706	Yes	Yes

BOLD = 95th percentile queue is anticipated to exceed the available storage.

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

7.6 NEAR-TERM DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

7.6.1 RECOMMENDED IMPROVEMENTS AT INTERSECTIONS

Improvement strategies have been recommended at intersections that have been identified as deficient in an effort to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS "D" or better). The effectiveness of the recommended improvement strategies discussed below to address EAPC traffic deficiencies is presented in Table 7-3.

The applicant shall participate in the funding of off-site improvements, including traffic signals that are needed to serve cumulative traffic conditions through the payment of Western Riverside County Transportation Uniform Mitigation Fees (TUMF), Mira Loma Road and Bridge Benefit District (RBBD) fees, City of Jurupa Valley Development Impact Fees (DIF) or a fair share contribution as directed by the City. These fees are collected as part of a funding mechanism aimed at ensuring that regional highways and arterial expansions keep pace with the projected population increases. Each of the improvements discussed above have been identified as being included as part of TUMF fee program, RBBD fee program, City DIF fee program or fair share contribution in Section 10.0 *Local and Regional Funding Mechanisms* of this TIA.

Worksheets for EAPC (2016) conditions, with improvements, HCM calculations are provided in Appendix "7.4".

7.6.2 RECOMMENDED IMPROVEMENTS TO ADDRESS QUEUES

As shown on Table 7-4, the 95th percentile queues for EAPC (2016) traffic conditions, with improvements, indicates there are no potential queuing issues anticipated during the weekday peak hours. Improvements assumed include the third eastbound and third westbound through lanes across the bridge over the I-15 Freeway along Limonite Avenue, consistent with the intersection improvements on Table 7-3. In addition, improvements also include optimal cycle lengths for all intersections along Limonite Avenue (assumed as part of the coordinated system), optimal green time splits for turning movements at each intersection, and the previously improved turn pocket lengthening recommendations as discussed in Section 6.6 *Recommended Improvements*. With these proposed improvements, it is anticipated that there would be no queuing issues with the exception of the intersection of Pats Ranch Road at Limonite Avenue. An additional 50 feet, for a total of 300-feet of stacking, is necessary to accommodate the anticipated 95th percentile queues for the westbound left turn lane at Pats Ranch Road, which can be accommodated through restriping. Worksheets for EAPC (2016) conditions off-ramp queuing analysis, with improvements, are provided in Appendix "7.5".

Table 7-3

EAPC (2016) Conditions Intersection Analysis With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)			Level of Service		
			Northbound			Southbound			Eastbound			Westbound								
			L	T	R	L	T	R	L	T	R	L	T	R	AM	Mid	PM	AM	Mid	PM
2	I-15 SB Ramps / Limonite Av.																			
	- Without Improvements	TS	0	0	0	1	1	1	0	2	1	2	2	0	**59.7**	N/A	**87.0**	**E**	N/A	**F**
	- With Improvements	TS	0	0	0	1	1	1	0	**3**	1	2	**3**	0	44.1	N/A	53.6	D	N/A	D
3	I-15 NB Ramps / Limonite Av.																			
	- Without Improvements	TS	1	1	1	0	0	0	2	2	0	0	2	1	**71.5**	N/A	**65.1**	**E**	N/A	**E**
	- With Improvements	TS	1	1	1	0	0	0	2	**3**	0	0	**3**	1	38.7	N/A	37.7	D	N/A	D
8	Pats Ranch Rd. / 68th St.																			
	- Without Improvements	AWS	0	0	0	1	0	1	1	1	0	0	2	1	**87.3**	**47.8**	18.4	**F**	**E**	C
	- With Improvements	**TS**	**1**	**1**	0	1	**1**	**1>**	1	**2**	0	**1**	2	1	18.1	17.2	9.5	B	B	A

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

N/A = Not applicable. Intersection not evaluated during the mid-day peak hour.

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; > = Right-Turn Overlap Phasing; >> = Free-Right Turn Lane; **1** = Improvement

[2] Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control.

[3] AWS = All-Way Stop; TS = Traffic Signal

Table 7-4

EAPC Conditions Peak Hour Off-Ramp Queuing Analysis With Improvements [1]

Intersection	Movement	Stacking (Feet)	95th Percentile Stacking Distance Required (Feet)		Acceptable? [2]	
			Hour	PM Peak Hour	AM	PM
I-15 SB Off-Ramp / Limonite Av.						
	SBL	400	168	266	Yes	Yes
	SBL/T/R	1,175	265	390	Yes	Yes
	SBR	400	240	343	Yes	Yes
	EBT	1,120	1,094	593	Yes	Yes
	EBR	1,120	342	375	Yes	Yes
	WBL	275	234	164	Yes	Yes
	WBT	620	55	48	Yes	Yes
I-15 NB Off-Ramp / Limonite Av.						
	NBL	450	273	314	Yes	Yes
	NBL/T/R	1,290	309	384	Yes	Yes
	NBR	450	273	317	Yes	Yes
	EBL	300	209	222	Yes	Yes
	EBT	620	78	99	Yes	Yes
	WBT	1,080	762	437	Yes	Yes
	WBR	635	267	114	Yes	Yes
Pats Ranch Rd. / Limonite Av.						
	EBL	200	9	42	Yes	Yes
	EBT	1,080	280	996	Yes	Yes
	EBR	1,080	74	883	Yes	Yes
	WBL	**300**	168	287	Yes	Yes
	WBT	825	88	445	Yes	Yes
	WBR	825	0	8	Yes	Yes
Wineville Av. / Limonite Av.						
	EBL	250	114	235	Yes	Yes
	EBT	825	68	743	Yes	Yes
	EBR	360	31	363	Yes	Yes
	WBL	**300**	180	310	Yes	Yes
	WBT	2,480	418	616	Yes	Yes

BOLD = 95th percentile queue is anticipated to exceed the available storage.

1 = Improvement (restriping)

[1] Improvements include 3 lanes in each direction on the bridge over the I-15 Freeway and traffic signal modifications for intersections along Limonite Avenue that include optimal cycle lengths (120-seconds) and optimization of green time splits.

[2] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

8 HORIZON YEAR (2035) TRAFFIC CONDITIONS

This section discusses the methods used to develop Horizon Year (2035) Without and With Project traffic forecasts, and the resulting intersection operations and traffic signal warrant analyses.

8.1 ROADWAY IMPROVEMENTS

As shown on Exhibit 8-1, the lane configurations and traffic controls assumed to be in place for Horizon Year (2035) conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for Horizon Year (2035) conditions only (e.g., intersection and roadway improvements along the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by nearby cumulative developments to provide site access are also assumed to be in place for Horizon Year (2035) conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways, including but not limited to the extension of Pats Ranch Road to the north for access to Tract 33428 and to the south for access to the Riverbend project).

8.2 HORIZON YEAR (2035) WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-processed volumes obtained from the RivTAM. The weekday ADT, weekday AM, and weekday PM peak hour volumes which can be expected for Horizon Year Without Project traffic conditions are shown on Exhibit 8-2. Exhibit 8-3 shows the Horizon Year Without Project Mid-day volumes.

8.3 HORIZON YEAR (2035) WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-processed volumes obtained from the RivTAM, plus Project traffic. The weekday ADT, weekday AM, and weekday PM peak hour volumes which can be expected for Horizon Year With Project traffic conditions are shown on Exhibit 8-4. The Horizon Year With Project Mid-day volumes are shown on Exhibit 8-5.

8.4 INTERSECTION OPERATIONS ANALYSIS

8.4.1 HORIZON YEAR (2035) WITHOUT PROJECT TRAFFIC CONDITIONS

LOS calculations were conducted for the study intersections to evaluate their operations under Horizon Year Without Project conditions with roadway and intersection geometrics consistent with Section 8.1 *Roadway Improvements*. As shown in Table 8-1, the study area intersections are anticipated to operate at acceptable levels of service, with the exception of the following locations:

EXHIBIT 8-1: HORIZON YEAR (2035) NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS

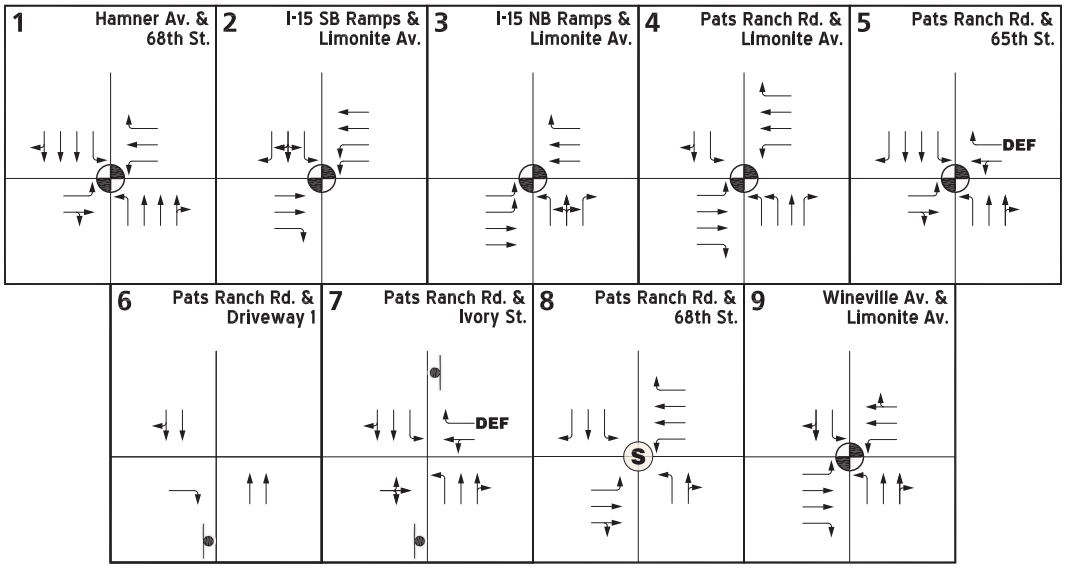
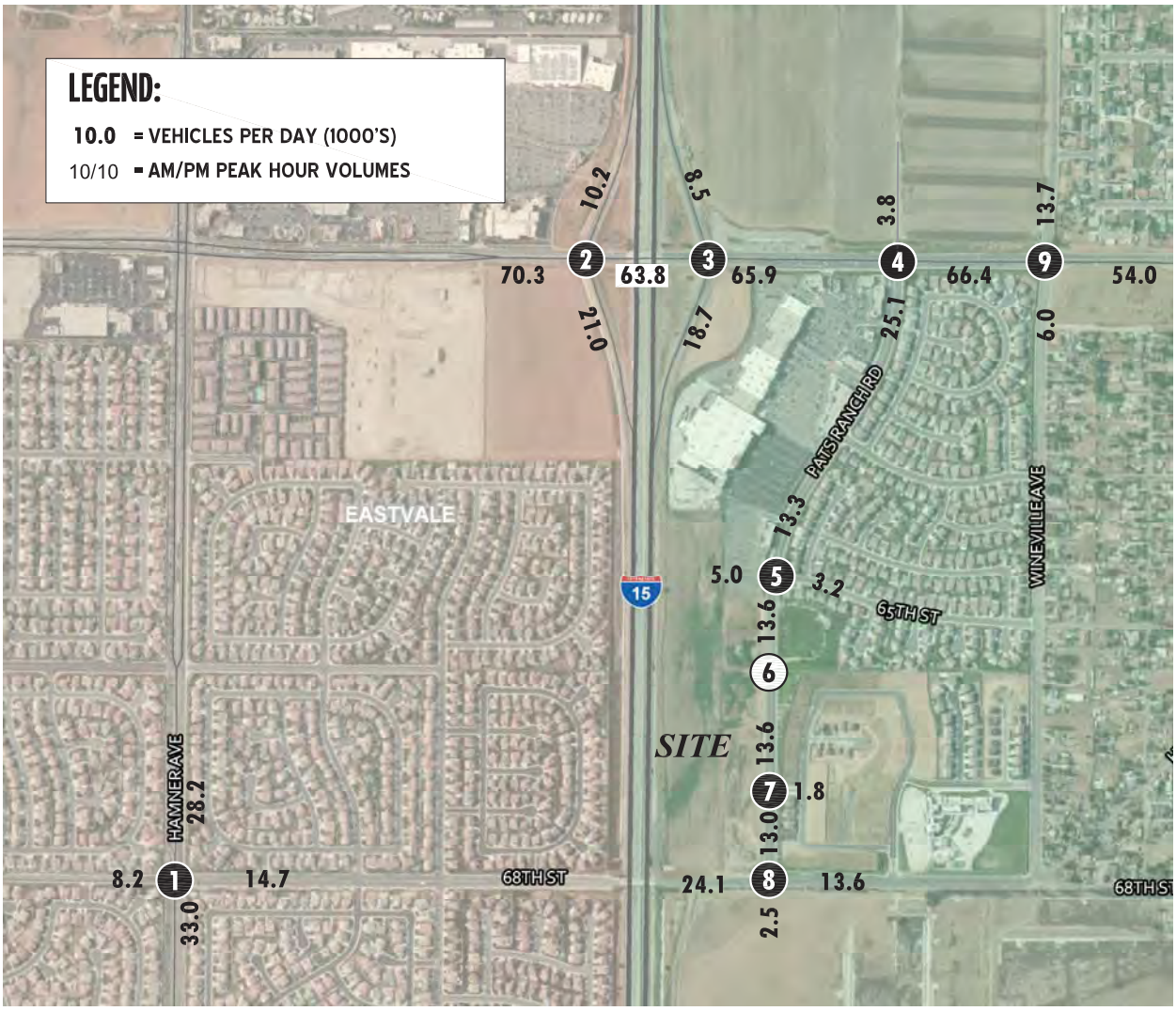


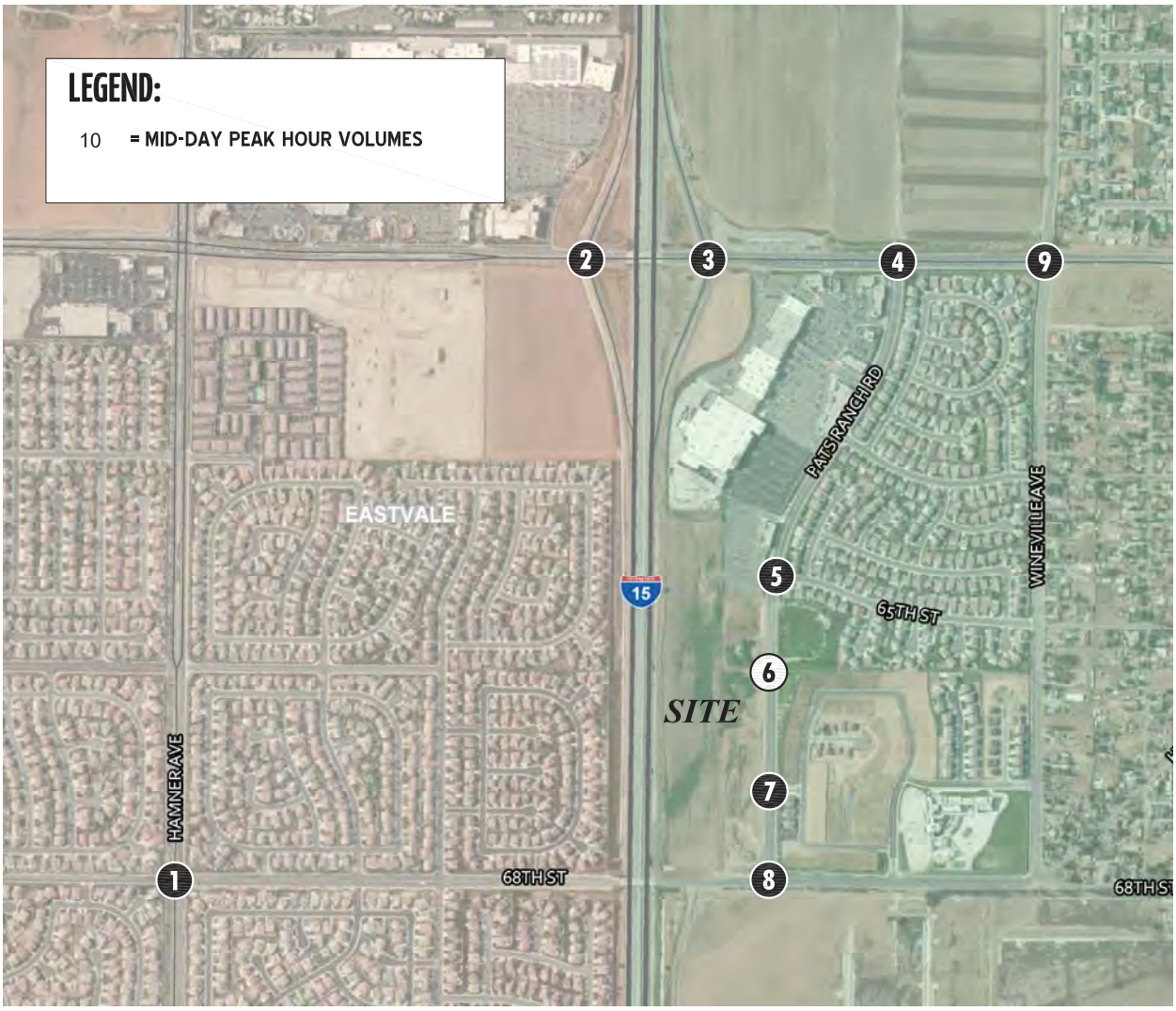
EXHIBIT 8-2: HORIZON YEAR (2035) WITHOUT PROJECT VOLUMES



1 Hamner Av. & 68th St.	2 I-15 SB Ramps & Limonite Av.	3 I-15 NB Ramps & Limonite Av.	4 Pats Ranch Rd. & Limonite Av.	5 Pats Ranch Rd. & 65th St.
54(103) 708(906) 82(186) → 154(185) ← 199(151) ← 309(292)	494(628) 2(0) 277(518) → 1248(2276) ← 909(707)	722(447) ← 1751(2501)	104(163) 50(100) 17(50) → 20(21) ← 1698(2197) ← 359(419)	17(75) 230(562) 14(100) → 64(37) ← 12(43) ← 63(14)
153(84) → 204(125) → 92(52) → 55(85) 847(1335) 194(276)	2265(1898) → 719(379) →	363(192) → 2179(2244) → 433(537) 5(1) 415(995)	70(110) → 1189(2316) → 197(575) → 671(589) 50(100) 283(427)	89(77) → 10(12) → 50(53) → 85(158) 582(286) 58(20)

6 Pats Ranch Rd. & Driveway 1	7 Pats Ranch Rd. & Ivory St.	8 Pats Ranch Rd. & 68th St.	9 Wineville Av. & Limonite Av.
Future Intersection	279(577) 64(63) → 164(35) ← 139(12)	333(403) 28(93) 58(92) → 88(60) ← 732(408) ← 5(15)	300(421) 91(112) 86(149) → 59(126) ← 1689(2094) ← 33(69)
	561(428) 93(31) →	484(345) → 786(453) → 17(57) → 50(33) 82(54) 13(9)	177(365) → 1244(2314) → 68(112) → 88(121) 126(56) 60(43)

EXHIBIT 8-3: HORIZON YEAR (2035) WITHOUT PROJECT MID-DAY VOLUMES

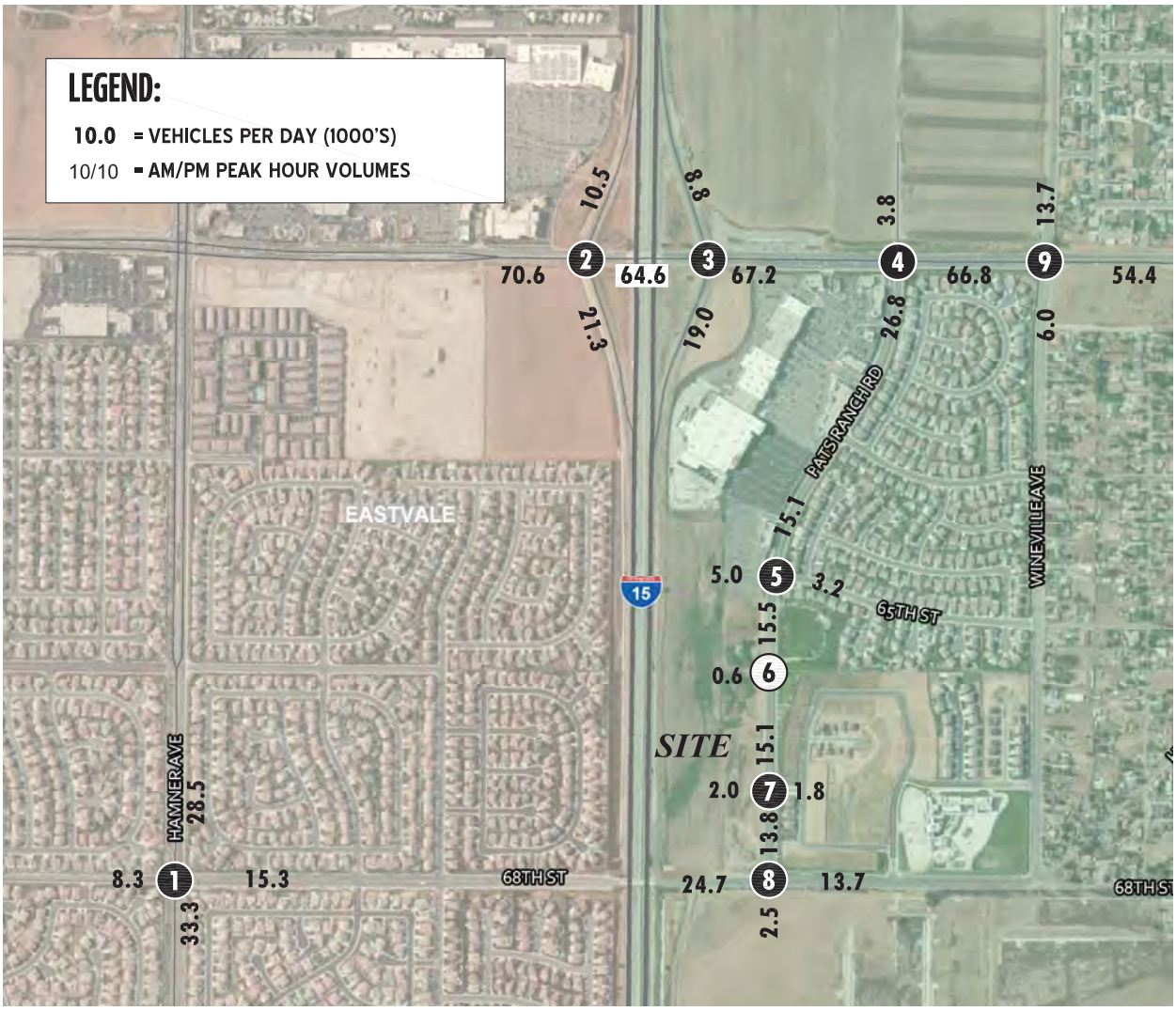


1 Hamner Av. & 68th St.	2 I-15 SB Ramps & Limonite Av.	3 I-15 NB Ramps & Limonite Av.	4 Pats Ranch Rd. & Limonite Av.	5 Pats Ranch Rd. & 65th St.
122 → 867 → 87 ← 175 ← 168 ← 285 84 → 107 → 58 ← 60 ↑ 1325 ← 267	Not Analyzed for Mid-Day Peak Hour Conditions	Not Analyzed for Mid-Day Peak Hour Conditions	Not Analyzed for Mid-Day Peak Hour Conditions	47 → 454 → 66 ← 41 ← 14 ← 35 50 → 4 → 47 ← 98 ↑ 461 ← 45

6 Pats Ranch Rd. & Driveway 1	7 Pats Ranch Rd. & Ivory St.	8 Pats Ranch Rd. & 68th St.	9 Wineville Av. & Limonite Av.
Future Intersection	437 → 99 → 203 ← 125 402 ↑ 123 ←	399 → 93 → 163 ← 183 ← 599 ← 15 341 → 494 → 57 ← 33 ↑ 54 ← 9	Not Analyzed for Mid-Day Peak Hour Conditions

N

EXHIBIT 8-4: HORIZON YEAR (2035) WITH PROJECT VOLUMES



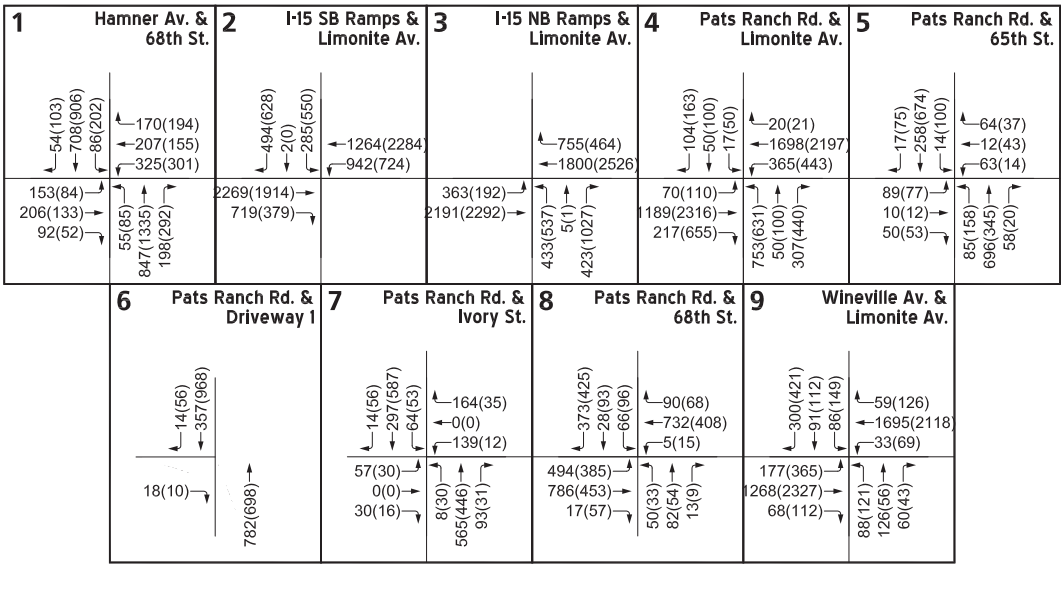
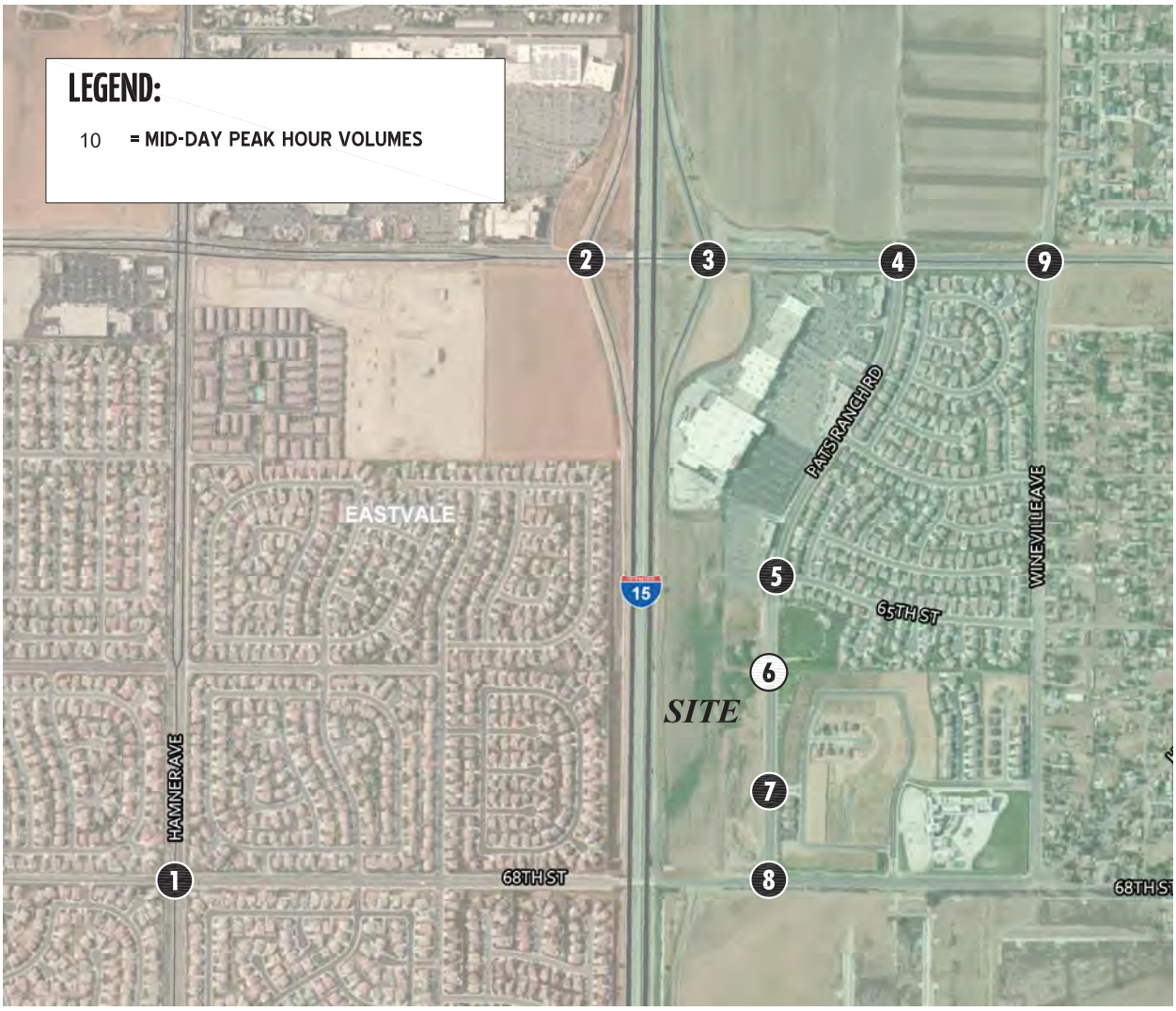


EXHIBIT 8-5: HORIZON YEAR (2035) WITH PROJECT MID-DAY VOLUMES



1 Hamner Av. & 68th St.
122 867 111 — 189 ← 175 ← 298
84 → 119 → 58 — 60 ↑ 1,325 ↑ 291 ←

2 I-15 SB Ramps & Limonite Av.
Not Analyzed for Mid-Day Peak Hour Conditions

3 I-15 NB Ramps & Limonite Av.
Not Analyzed for Mid-Day Peak Hour Conditions

4 Pats Ranch Rd. & Limonite Av.
Not Analyzed for Mid-Day Peak Hour Conditions

5 Pats Ranch Rd. & 65th St.
107 562 66 — 41 ← 14 ← 35
84 → 4 → 60 — 122 ↑ 520 ↑ 45 ←

6 Pats Ranch Rd. & Driveway 1
48 609 — 663 ↑
14 →

7 Pats Ranch Rd. & Ivory St.
56 447 99 — 202 ← 0 ← 125
59 → 0 → 16 — 48 ↑ 401 ↑ 123 ←

8 Pats Ranch Rd. & 68th St.
433 93 170 — 195 ← 599 ← 15
401 → 494 → 57 — 33 ↑ 54 ↑ 9 ←

9 Wineville Av. & Limonite Av.
Not Analyzed for Mid-Day Peak Hour Conditions

N

Table 8-1

Horizon Year (2035) Conditions Intersection Analysis

#	Intersection	Traffic Control[2]	2035 Without Project						2035 With Project						Acceptable LOS
			Delay [1] (secs.)			Level of Service			Delay [1] (secs.)			Level of Service			
			AM	Mid	PM	AM	Mid	PM	AM	Mid	PM	AM	Mid	PM	
1	Hamner Av. / 68th Street	TS	48.7	47.8	49.6	D	D	D	52.0	50.8	53.2	D	D	D	D
2	I-15 SB Ramps / Limonite Av.	TS	**>200.0**	N/A	**98.4**	**F**	N/A	**F**	**>200.0**	N/A	**98.4**	**F**	N/A	**F**	D
3	I-15 NB Ramps / Limonite Av.	TS	54.6	N/A	**138.4**	D	N/A	**F**	**61.3**	N/A	**145.4**	**E**	N/A	**F**	D
4	Pats Ranch Rd. / Limonite Av.	TS	**120.2**	N/A	**>200.0**	**F**	N/A	**F**	**129.6**	N/A	**>200.0**	**F**	N/A	**F**	D
5	Pats Ranch Rd. / 65th St.	TS	19.3	14.9	25.9	B	B	C	49.2	14.4	27.6	D	B	C	D
6	Pats Ranch Rd. / Driveway 1	**CSS**	--	--	--	--	--	--	9.6	10.7	11.1	A	B	B	D
7	Pats Ranch Rd. / Ivory St.	CSS	28.6	25.7	15.6	D	D	C	30.7	34.8	27.9	D	D	D	D
8	Pats Ranch Rd. / 68th St.	AWS	**>100.0**	**>100.0**	**85.0**	**F**	**F**	**F**	**>100.0**	**>100.0**	**99.2**	**F**	**F**	**F**	D
9	Wineville Av. / Limonite Av.	TS	**77.2**	N/A	**>200.0**	**E**	N/A	**F**	**77.7**	N/A	**>200.0**	**E**	N/A	**F**	D

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

N/A = Not applicable. Intersection not evaluated during the mid-day peak hour.

[1] Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[2] CSS = Cross-street Stop; AWS = All-Way Stop; TS = Traffic Signal; **CSS** = Improvement

ID	Intersection Location
2	I-15 Southbound Ramps / Limonite Avenue – LOS "F" AM and PM peak hours
3	I-15 Northbound Ramps / Limonite Avenue – LOS "F" PM peak hour only
4	Pats Ranch Road / Limonite Avenue – LOS "E" AM peak hour; LOS "F" PM peak hour
8	Pats Ranch Road / 68th Street – LOS "F" AM, Mid-day, and PM peak hours
9	Wineville Avenue / Limonite Avenue – LOS "F" AM and PM peak hours

The intersection operations analysis worksheets for Horizon Year Without Project traffic conditions are included in Appendix "8.1" of this TIA.

8.4.2 HORIZON YEAR (2035) WITH PROJECT TRAFFIC CONDITIONS

As shown on Table 8-1, there are no additional study area intersections anticipated to experience unacceptable LOS (LOS "E" or worse) with the addition of Project traffic during one or more peak hours in addition to those previously identified under Horizon Year Without Project conditions. The intersection operations analysis worksheets for Horizon Year With Project traffic conditions are included in Appendix "8.2" of this TIA.

Measures to address long-range deficiencies for Horizon Year traffic conditions are discussed in Section 8.7 *Long-Range Deficiencies and Recommended Improvements.*

8.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

The intersection of Pats Ranch Road and Ivory Street is anticipated to warrant a traffic signal under Horizon Year Without Project traffic conditions (see Appendix "8.3"). There are no additional intersections anticipated to warrant a traffic signal under Horizon Year With Project traffic conditions in addition to those previously identified under Horizon Year Without Project conditions (see Appendix "8.4").

As noted previously, a signal warrant defines the minimum condition under which the installation of a traffic signal might be warranted. Meeting this threshold condition does not require that a traffic control signal be installed at a particular location, but rather, that other traffic factors and conditions be evaluated in order to determine whether the signal is truly justified. As the intersection of Pats Ranch Road and Ivory Street is anticipated to operate at acceptable LOS during the peak hours, the installation of a traffic signal has not been recommended.

8.6 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the southbound and northbound off-ramps at the I-15 Freeway at Limonite Avenue interchange to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-15 Freeway mainline. Queuing analysis findings are presented in Table 8-2 for Horizon Year Without and With Project traffic conditions. Off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline.

As shown on Table 8-2, the following movements may potentially experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for Horizon Year Without and With Project traffic conditions:

ID	Intersection Location
3	I-15 Northbound Ramps / Limonite Avenue – Northbound Left Turn Lane, Shared Left-Through-Right Turn Lane, and Right Turn Lane (PM peak hour only)

The 95th percentile queues for Horizon Year Without and With Project traffic conditions indicates potential queuing for the movements and peak hours identified above. As shown, the analysis indicates that potential queues would exceed the turn pocket lengths and could spillback into the adjacent through lanes and potentially spillback onto the I-15 Freeway mainline. Worksheets for Horizon Year Without Project conditions off-ramp queuing analysis are provided in Appendix "8.5". Worksheets for Horizon Year With Project conditions off-ramp queuing analysis are provided in Appendix "8.6".

8.7 LONG-RANGE DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

8.7.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies have been recommended at intersections that have been identified as deficient in an effort to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS "D" or better). The effectiveness of the recommended improvement strategies discussed below to address Horizon Year traffic deficiencies is presented in Table 8-3.

The applicant shall participate in the funding of off-site improvements, including traffic signals that are needed to serve cumulative traffic conditions through the payment of Western Riverside County Transportation Uniform Mitigation Fees (TUMF), Mira Loma Road and Bridge Benefit District (RBBD) fees, City of Jurupa Valley Development Impact Fees (DIF) or a fair share contribution as directed by the City. These fees are collected as part of a funding mechanism aimed at ensuring that regional highways and arterial expansions keep pace with the projected population increases. Each of the improvements discussed above have been identified as being included as part of TUMF fee program, RBBD fee program, City DIF fee program or fair share contribution in Section 10.0 *Local and Regional Funding Mechanisms* of this TIA.

At the City's request, exhibits have been provided to demonstrate the feasibility of the recommended improvements at Pats Ranch Road and Wineville Avenue on Limonite Avenue. Consistent with Table 8-3, the recommended improvements for the intersection of Pats Ranch Road and Limonite Avenue for Horizon Year traffic conditions is shown on Exhibit 8-6. Similarly, the recommended improvements for the intersection of Wineville Avenue and Limonite Avenue for Horizon Year traffic conditions are shown on Exhibit 8-7.

Worksheets for Horizon Year Without and With Project conditions, with improvements, HCM calculations are provided in Appendix "8.7" and Appendix "8.8".

Table 8-2

Horizon Year (2035) Conditions Peak Hour Off-Ramp Queuing Analysis

Intersection	Movement	Stacking (Feet)	95th Percentile Stacking Distance Required (Feet)		Acceptable? [1]	
			Hour	PM Peak Hour	AM	PM
2035 Without Project						
I-15 SB Off-Ramp / Limonite Av.						
	SBL	400	238	342	Yes	Yes
	SBL/T/R	1,175	305	417	Yes	Yes
	SBR	400	271	373	Yes	Yes
I-15 NB Off-Ramp / /Limonite Av.						
	NBL	450	277	**612**	Yes	**No**
	NBL/T/R	1,290	322	**1,405**	Yes	**No**
	NBR	450	275	**562**	Yes	**No**
2035 With Project						
I-15 SB Off-Ramp / Limonite Av.						
	SBL	400	243	373	Yes	Yes
	SBL/T/R	1,175	308	443	Yes	Yes
	SBR	400	261	397	Yes	Yes
I-15 NB Off-Ramp / /Limonite Av.						
	NBL	450	279	**593**	Yes	**No**
	NBL/T/R	1,290	328	**1,419**	Yes	**No**
	NBR	450	284	**553**	Yes	**No**

BOLD = 95th percentile queue is anticipated to exceed the available storage.

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

Table 8-3

Horizon Year (2035) Conditions Intersection Analysis With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)			Level of Service		
			Northbound			Southbound			Eastbound			Westbound								
			L	T	R	L	T	R	L	T	R	L	T	R	AM	Mid	PM	AM	Mid	PM
2	I-15 SB Ramps / Limonite Av.																			
	- Horizon Year (2035) Without Project	TS	0	0	0	1	1	**2**	0	**3**	1	**0**	**3**	**1**	9.8	N/A	8.6	A	N/A	A
	- Horizon Year (2035) With Project	TS	0	0	0	1	1	**2**	0	**3**	1	**0**	**3**	**1**	10.5	N/A	8.7	B	N/A	A
3	I-15 NB Ramps / Limonite Av.																			
	- Horizon Year (2035) Without Project	TS	1	1	**2**	0	0	0	**0**	**3**	**1**	0	**3**	1	15.6	N/A	26.3	B	N/A	C
	- Horizon Year (2035) With Project	TS	1	1	**2**	0	0	0	**0**	**3**	**1**	0	**3**	1	16.4	N/A	27.6	B	N/A	C
4	Pats Ranch Rd. / Limonite Av.																			
	- Horizon Year (2035) Without Project	TS	2	**1**	**1>**	**1**	**1**	**1>**	**1**	**3**	**1>**	**2**	**3**	**1**	20.6	N/A	45.8	C	N/A	D
	- Horizon Year (2035) With Project	TS	2	**1**	**1>**	**1**	**1**	**1>**	**1**	**3**	**1>**	**2**	**3**	**1**	23.1	N/A	52.0	C	N/A	D
8	Pats Ranch Rd. / 68th St.																			
	- Horizon Year (2035) Without Project	**TS**	**1**	**1**	0	1	**1**	**1>**	**1**	**2**	0	**1**	2	1	30.9	43.1	40.6	C	D	D
	- Horizon Year (2035) With Project	**TS**	**1**	**1**	0	1	**1**	**1>**	**1**	**2**	0	**1**	2	1	52.8	54.9	40.8	D	D	D
9	Wineville Av. / Limonite Av.																			
	- Horizon Year (2035) Without Project	TS	1	2	0	1	**2**	**1>**	**2**	**3**	**0**	**2**	**3**	0	20.3	N/A	37.3	C	N/A	D
	- Horizon Year (2035) With Project	TS	1	2	0	1	**2**	**1>**	**2**	**3**	**0**	**2**	**3**	0	20.3	N/A	38.0	C	N/A	D

N/A = Not applicable. Intersection not evaluated during the mid-day peak hour.

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; > = Right-Turn Overlap Phasing; >> = Free-Right Turn Lane; **1** = Improvement

[2] Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all-way stop control.

[3] TS = Traffic Signal

EXHIBIT 8-6: CONCEPTUAL STRIPING FOR PATS RANCH RD. AND LIMONITE AV.

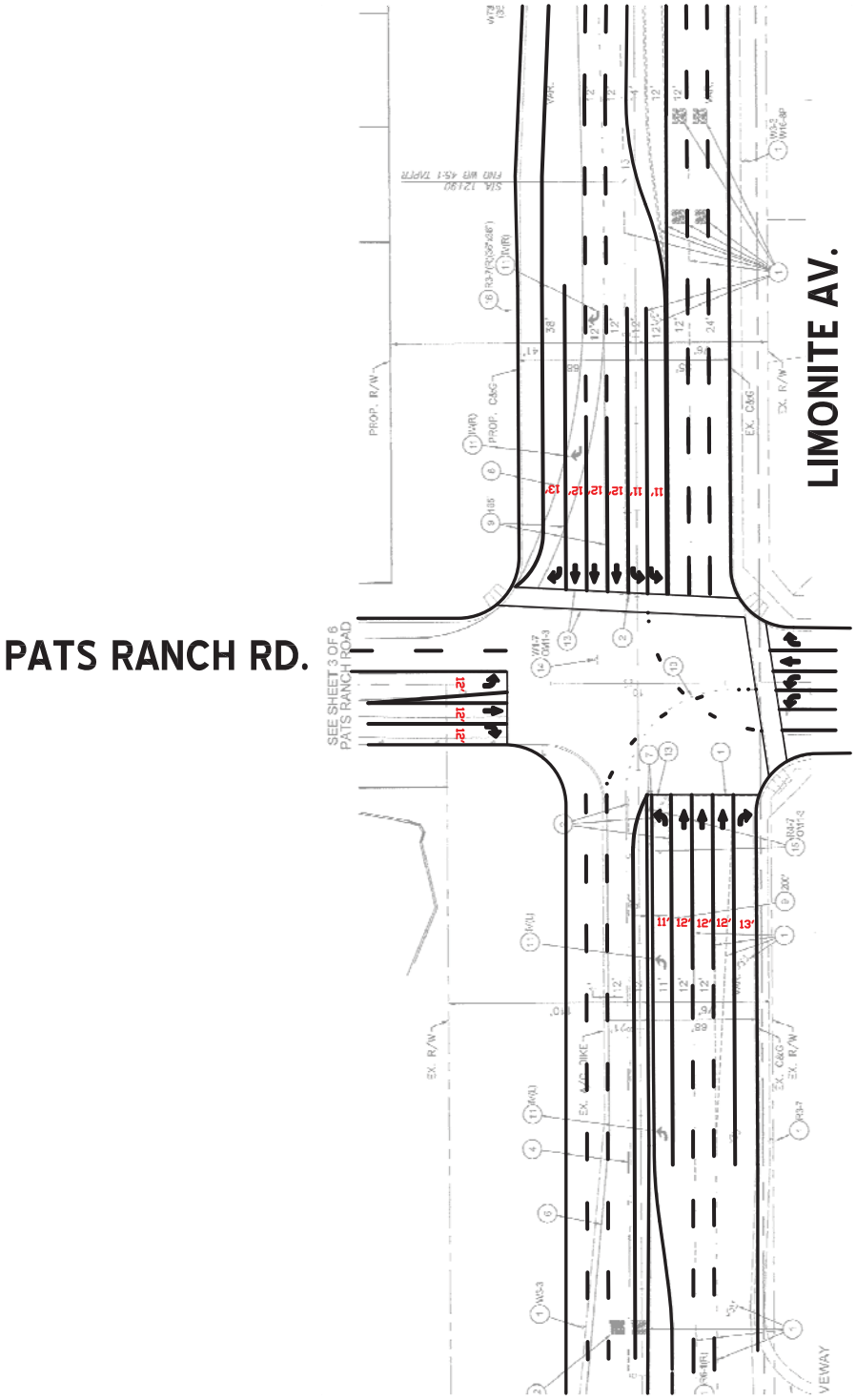
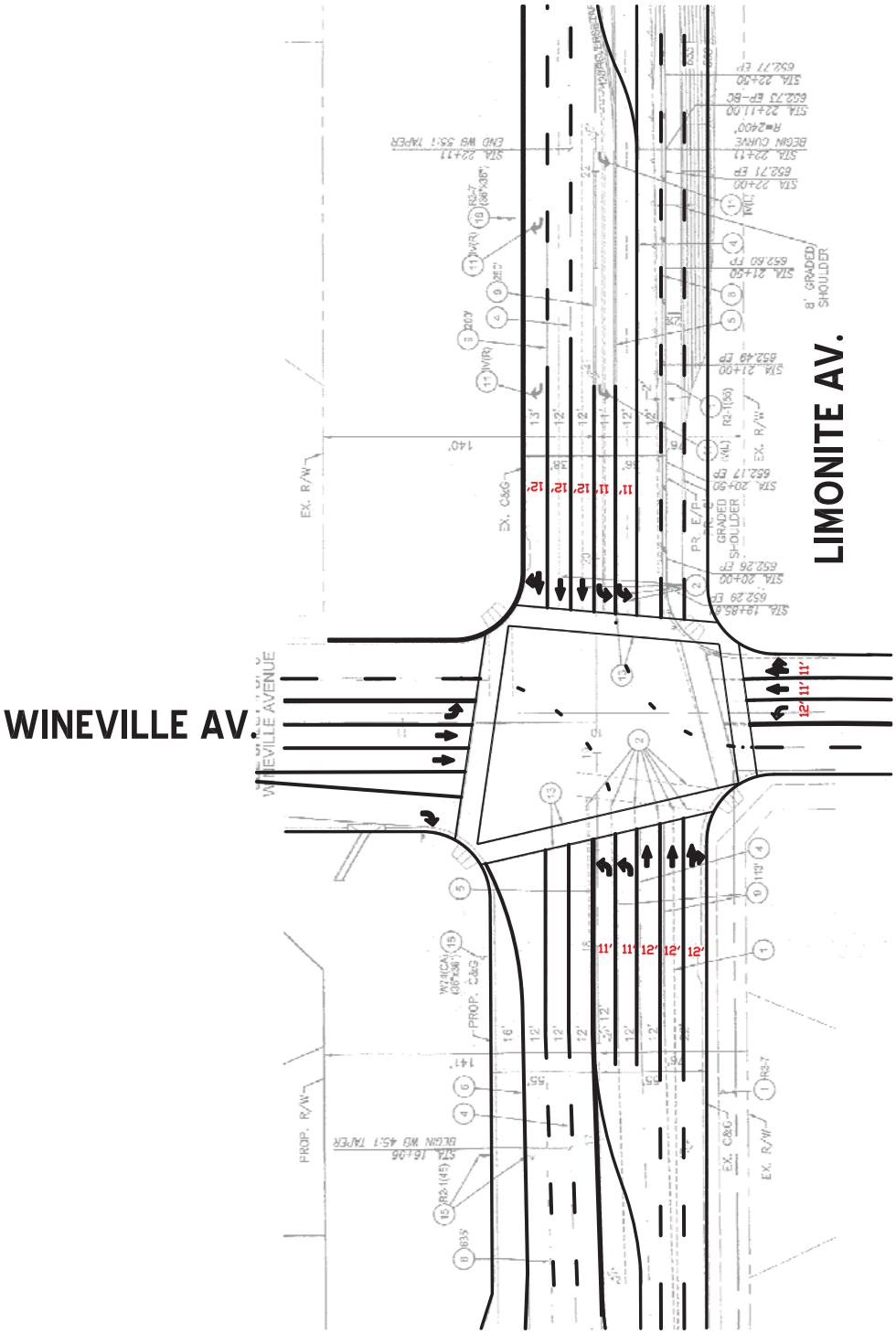


EXHIBIT 8-7: CONCEPTUAL STRIPING FOR WINEVILLE AV. AND LIMONITE AV.



8.7.2 RECOMMENDED IMPROVEMENTS TO ADDRESS OFF-RAMP QUEUES

As shown on Table 8-4, the 95th percentile queues for Horizon Year Without and With Project traffic conditions, with improvements, indicates there are no potential queuing issues anticipated with the proposed interchange improvements. Improvements assumed include the proposed I-15 Freeway at Limonite Avenue interchange improvements (shown in Appendix "7.1"), and consistent with the intersection improvements on Table 8-3. In addition, improvements also include optimal cycle lengths for all intersections along Limonite Avenue (assumed as part of the coordinated system) and optimal green time splits for turning movements at each intersection. With these proposed improvements, it is anticipated that there would be no queuing issues under Horizon Year traffic conditions. Worksheets for Horizon Year Without and With Project conditions off-ramp queuing analysis, with improvements, are provided in Appendix "8.9" and Appendix "8.10".

Table 8-4

Horizon Year (2035) Conditions Peak Hour Off-Ramp Queuing Analysis With Improvements

Intersection	Movement	Stacking (Feet)	95th Percentile Stacking Distance Required (Feet)		Acceptable? [1]	
			Hour	PM Peak Hour	AM	PM
Horizon Year (2035) Without Project Conditions						
I-15 SB Off-Ramp / Limonite Av.						
	SBL	400	80	179	Yes	Yes
	SBL/T/R	1,175	151	213	Yes	Yes
	SBR	400	165	246	Yes	Yes
I-15 NB Off-Ramp / /Limonite Av.						
	NBL	450	182	177	Yes	Yes
	NBL/T/R	1,290	232	231	Yes	Yes
	NBR	450	172	318	Yes	Yes
Horizon Year (2035) With Project Conditions						
I-15 SB Off-Ramp / Limonite Av.						
	SBL	400	79	203	Yes	Yes
	SBL/T/R	1,175	162	243	Yes	Yes
	SBR	400	189	247	Yes	Yes
I-15 NB Off-Ramp / /Limonite Av.						
	NBL	450	142	197	Yes	Yes
	NBL/T/R	1,290	219	332	Yes	Yes
	NBR	450	172	343	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

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9 SITE ACCESS AND ON-SITE CIRCULATION

This section summarizes Project site access and on-site circulation recommendations.

The Project is proposed to have access on Pats Ranch Road, with right-in/right-out access only at Driveway 1 and full-access (i.e., no restricted turning movements) at Driveway 2. Driveway 2 is proposed to align with the existing Ivory Street on Pats Ranch Road. Regional access to the project site is provided via the I-15 Freeway and Limonite Avenue interchange.

Roadway improvements necessary to provide site access and on-site circulation are assumed to be constructed in conjunction with site development and are described below. These improvements should be in place prior to the issuance of the first Certificate of Occupancy.

9.1 SITE ADJACENT ROADWAY IMPROVEMENTS

The recommended site-adjacent roadway and on-site circulation improvements for the Project are described below. Exhibit 9-1 illustrates the site-adjacent roadway improvement recommendations. These improvements will need to be incorporated into the Project description prior to Project approval or imposed as conditions of approval as part of the Project approval.

Pats Ranch Road – Pats Ranch Road is a north-south oriented roadway located along the Project's eastern boundary. Pats Ranch Road is not a General Plan roadway, however, it is currently constructed to its ultimate roadway width as a higher classification, four-lane divided roadway. The only roadway improvements necessary along Pats Ranch Road are striping needs at the site access points.

68th Street – 68th Street is an east-west oriented roadway located along the Project's southern boundary. Construct 68th Street along the Project's frontage to Pats Ranch Road at its ultimate half-section width as a Major Highway (118-foot right-of-way) in compliance with applicable City of Jurupa Valley standards.

Wherever necessary, roadways adjacent to the Project, site access points and site-adjacent intersections will be constructed to be consistent with the identified roadway classifications and respective cross-sections in the City of Jurupa Valley General Plan Circulation Element.

9.2 SITE ACCESS IMPROVEMENTS

The recommended site access driveway improvements for the Project are described below. Exhibit 9-1 also illustrates the on-site and site adjacent recommended roadway lane improvements. Construction of on-site and site adjacent improvements are recommended to be constructed and should be in place prior to the issuance of the first Certificate of Occupancy.

EXHIBIT 9-1: SITE ACCESS AND SITE ADJACENT ROADWAY RECOMMENDATIONS

PATS RANCH ROAD IS A NORTH-SOUTH ORIENTED ROADWAY LOCATED ALONG THE PROJECT'S EASTERN BOUNDARY. PATS RANCH ROAD IS NOT A GENERAL PLAN ROADWAY, HOWEVER, IT IS CURRENTLY CONSTRUCTED TO ITS ULTIMATE ROADWAY WIDTH AS A HIGHER CLASSIFICATION, FOUR-LANE DIVIDED ROADWAY. THE ONLY ROADWAY IMPROVEMENTS NECESSARY ALONG PATS RANCH ROAD ARE STRIPING NEEDS AT THE SITE ACCESS POINTS.

ON-SITE TRAFFIC SIGNING AND STRIPING SHOULD BE IMPLEMENTED IN CONJUNCTION WITH DETAILED CONSTRUCTION PLANS FOR THE PROJECT SITE.

SIGHT DISTANCE AT EACH PROJECT ACCESS POINT SHOULD BE REVIEWED WITH RESPECT TO STANDARD CALTRANS AND CITY OF JURUPA VALLEY SIGHT DISTANCE STANDARDS AT THE TIME OF PREPARATION OF FINAL GRADING, LANDSCAPE AND STREET IMPROVEMENT PLANS.

68TH STREET IS AN EAST-WEST ORIENTED ROADWAY LOCATED ALONG THE PROJECT'S SOUTHERN BOUNDARY. CONSTRUCT 68TH STREET ALONG THE PROJECT'S FRONTAGE TO PATS RANCH ROAD AT ITS ULTIMATE HALF-SECTION WIDTH AS A MAJOR HIGHWAY (118-FOOT RIGHT-OF-WAY) IN COMPLIANCE WITH APPLICABLE CITY OF JURUPA VALLEY STANDARDS.

LEGEND:

= MAJOR ARTERIAL

Pats Ranch Road at Driveway 1 – Install a stop control on the eastbound approach and construct the intersection as a right-in/right-out only driveway with the following geometrics:

Northbound Approach: Two through lanes.
Southbound Approach: One through lane and one shared through-right turn lane.
Eastbound Approach: One right turn lane.
Westbound Approach: N/A

Pats Ranch Road at Ivory Street – This driveway is proposed to align with existing Ivory Street on the east side of Pats Ranch Road. Install a stop control on the eastbound approach and construct the intersection with the following geometrics:

Northbound Approach: One left turn lane, one through lane, and one shared through-right turn lane.
Southbound Approach: One left turn lane, one through lane, and one shared through-right turn lane.
Eastbound Approach: One shared left-through-right turn lane.
Westbound Approach: One shared left-through-right turn lane.

Pats Ranch Road at 68th Street – This intersection is proposed to align with the proposed driveway for the future development on the south side of 68th Street (Riverbend project). Project should contribute its fair share towards the installation of a traffic signal at the intersection and the construction of the following geometrics:

Northbound Approach: N/A
Southbound Approach: One left turn lane and one right turn lane with overlap phasing.
Eastbound Approach: One left turn lane and one through lane.
Westbound Approach: Two through lanes and one right turn lane.

Pats Ranch Road is proposed to extend to the south to provide access to the future Riverbend project. As such, a westbound left turn lane will be added as part of the Riverbend project to provide site access.

On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the Project site.

Sight distance at each project access point should be reviewed with respect to standard Caltrans and City of Jurupa Valley sight distance standards at the time of preparation of final grading, landscape and street improvement plans.

9.3 PEDESTRIAN AND BICYCLE ACCOMMODATIONS

The Project will construct curb and gutter and sidewalk improvements along their frontage. Crosswalks will be maintained at Pats Ranch Road and 65th Street and additional crosswalks will be provided at the future signalized intersection of Pats Ranch Road and 68th Street.

There is a planned Community Trail to the south along 68th Street and an existing Regional Trail to the southwest. The Project would provide to these trails via the planned sidewalk improvements and crosswalks at the intersection of Pats Ranch Road and 68th Street.

10 LOCAL AND REGIONAL FUNDING MECHANISMS

Transportation improvements within the City of Jurupa Valley are funded through a combination of direct project mitigation, fair share contributions or development impact fee programs, such as the County's Transportation Uniform Mitigation Fee (TUMF) program, Mira Loma Road and Bridge Benefit District (RBBD) fee program and the City of Jurupa Valley Development Impact Fee (DIF) program. Identification and timing of needed improvements is generally determined through local jurisdictions based upon a variety of factors.

Table 10-1 lists the incremental improvements that are required by Horizon Year traffic conditions to alleviate long-range circulation system deficiencies. The regional and local transportation impact fee programs have each been reviewed and compared to the recommended improvements for each impacted facility. Recommended improvements already identified and included in one of the pre-existing fee programs (i.e., TUMF, RBBD, City of Jurupa Valley DIF, etc.) are clearly denoted. If an impacted facility was found to require improvements beyond those already identified within one of the pre-existing regional or local fee programs, the project may be required to contribute the associated intersection or roadway fair-share percentage toward the costs of the recommended improvements. The fair-share calculations, presented on Table 10-1, indicate that the Project contributes 1.1% to 6.2% of new vehicle trips to these intersections.

The improvements listed in Table 10-1 are comprised of lane additions/modifications, installation of signals and signal modifications. As noted, the identified improvements are covered either by the TUMF Program, RBBD fee program, the City of Jurupa Valley DIF Program or as a fair-share contribution if not covered by a fee program. Depending on the width of the existing pavement and right-of-way, these improvements may involve only striping modifications or they may involve construction of additional pavement width. Additional discussion of the relevant pre-existing transportation impact fee programs is provided below.

10.1 TRANSPORTATION UNIFORM MITIGATION FEE (TUMF) PROGRAM

The TUMF program is administered by Western Riverside Council of Governments (WRCOG) based upon a regional Nexus Study completed in early 2003 and updated in 2009 to address major changes in right of way acquisition and improvement cost factors. TUMF identifies a network of backbone and local roadways that are needed to accommodate growth through 2035. This regional program was put into place to ensure that development pays its fair share and that funding is in place for construction of facilities needed to maintain the requisite level of service and critical to mobility in the region.

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Table 10-1
Table 1 of 2

Summary of Intersection Improvements

#	Intersection Location	Jurisdiction	Recommended Improvements[1]						Improvements in DIF,TUMF or RBBD[2]?	Fair Share %[3]
			Existing (2014)	E+P	EAP (2016)	EAPC (2016)	HY (2035) Without Project	HY (2035) With Project		
2	I-15 SB Ramps / Limonite Av.	Caltrans				3rd EB through lane	Same	Same	Yes (TUMF,RBBD)	--
						3rd WB through lane	Same	Same	Yes (TUMF,RBBD)	
							Modify the interchange by vacating WB left turn lanes and provide for an WB loop on ramp	Same	Yes (TUMF,RBBD)	
							2nd SB right turn lane	Same	Yes (TUMF,RBBD)	
3	I-15 NB Ramps / Limonite Av.	Caltrans				3rd EB through lane	Same	Same	Yes (TUMF,RBBD)	--
						3rd WB through lane	Same	Same	Yes (TUMF,RBBD)	
							Modify the interchange by vacating EB left turn lanes and provide for an EB loop on ramp	same	Yes (TUMF,RBBD)	
							2nd NB right turn lane	Same	Yes (TUMF,RBBD)	
4	Pats Ranch Rd. / Limonite Av.	Jurupa Valley			Lengthen the WBL to provide 250-feet of storage	Lengthen the WBL to provide 300-feet of storage	Same	Same	No	3.6%
						3rd EB through lane	Same	Same	Yes (TUMF)	
						3rd WB through lane	Same	Same	Yes (TUMF)	
							2nd WB left turn lane	Same	No	
							Modify the traffic signal to accommodate overlap phasing for the NB and EB right turn lanes	Same	No	

Table 10-1
Table 2 of 2

Summary of Intersection Improvements

#	Intersection Location	Jurisdiction	Recommended Improvements[1]						Improvements in DIF,TUMF or RBBD[2]?	Fair Share %[3]
			Existing (2014)	E+P	EAP (2016)	EAPC (2016)	HY (2035) Without Project	HY (2035) With Project		
8	Pats Ranch Rd. / 68th St.	Jurupa Valley	Traffic Signal	Same	Same	Same	Same	Same	No	4.1%
			Modify the traffic signal to accommodate overlap phasing for the SB right turn lane	Same	Same	Same	Same	Same	No	
						NB left turn lane	Same	Same	No	
						NB shared through-right turn lane	Same	Same	No	
						SB through lane	Same	Same	No	
						2nd EB through lane	Same	Same	No	
						WB left turn lane	Same	Same	No	
9	Wineville Av. / Limonite Av.	Jurupa Valley			Lengthen the WBL to provide 300-feet of storage	Same	Same	Same	No	1.1%
							2nd SB through lane	Same	No	
							SB right turn lane with overlap phasing	Same	No	
							2nd EB left turn lane	Same	No	
							3rd EB through lane	Same	Yes (TUMF)	
							2nd WB left turn lane	Same	No	
							3rd WB through lane	Same	Yes (TUMF)	

[1] All recommended improvements are consistent with the general plan designations of the respective jurisdictions in which they are located.

[2] Improvements are identified as being included in the Western Riverside Council of Governments (WRCOG) Transportation Uniform Mitigation Fee (TUMF) program or County of Riverside's Mira Loma Road and Bridge Benefit District (RBBD) Facilities List.

[3] Program improvements constructed by project may be eligible for fee credit, at discretion of City. See Table 10-2 for Fair Share Calculations.

TUMF fees are imposed on new residential, industrial, and commercial development through application of the TUMF fee ordinance and fees are collected at the building or occupancy permit stage. The fee is $6,231 per dwelling unit (applicable to the proposed Project). In addition, an annual inflation adjustment is considered each year in January. In this way, TUMF fees are adjusted upwards on a regular basis to ensure that the development impact fees collected keep pace with construction and labor costs, etc.

As shown in Table 10-1, a number of the facilities forecasted to be deficient are programmed for improvements through the TUMF program. The Project applicant will be subject to the TUMF fee program and will pay the requisite TUMF fees at the rates then in effect pursuant to the TUMF Ordinance. WRCOG has a successful track record funding and overseeing the construction of improvements funded through the TUMF program. In total, the TUMF program is anticipated to generate nearly $5 billion in transportation projects for Western Riverside County.

10.2 MIRA LOMA ROAD AND BRIDGE BENEFIT DISTRICT (RBBD) PROGRAM

Similar to other regions within Riverside County, the City of Jurupa Valley is anticipated to experience substantial growth. Extensive improvements are necessitated by new development within the region. In particular, Riverside County recognized the impact of this growth on the vicinity of the study area when it formed the Mira Loma RBBD. The proposed Project lies within Zone E of the Mira Loma RBBD. Zone E is generally bounded by Bellegrave Avenue to the north, Hellman Avenue to the west, Hamner Avenue to the east and the Santa Ana River to the south. As discussed above, the facilities improvements that will be ultimately constructed as a result of the collection of these fees and assessments are significant. They include:

Mira Loma Road and Bridge Benefits District (Zone E):

- Interchange improvements at I-15 Freeway at Limonite Avenue
- Overcrossing improvements to Bellegrave Avenue at the I-15 Freeway
- Landscaped median improvements to Limonite Avenue between Hamner Avenue and Wineville Avenue (where landscaped median improvements include curb, gutter, landscaping and irrigation)
- Landscaped median improvements to Hamner Avenue between Bellegrave Avenue and the Santa Ana River (where landscaped median improvements include curb, gutter, landscaping and irrigation)

10.3 CITY OF JURUPA VALLEY DEVELOPMENT IMPACT FEE (DIF) PROGRAM

The City does not have its own Development Impact Fee (DIF) program. However, the City is collecting DIF fees consistent with the County's DIF fee program. The Project area is located within the County's Jurupa Area Plan and therefore will be subject to County of Riverside Development Impact Fees (DIF) in an effort by the County to mitigate development throughout its unincorporated area. The DIF program consists of two separate transportation components: Roads, Bridges and Major Improvements component and the Traffic Signals component.

Eligible facilities for funding by the County DIF program are identified on the County's Public Needs List.

The cost of signalizing DIF network intersections is identified under the Traffic Signals component of the DIF program. County staff generally defines DIF eligible intersections as those consisting of two intersecting General Plan roadways. Fee credits and reimbursements will be available as part of the Fee Program and will only be given to projects that are identified as a Fee Program facility. The Project's Conditions of Approval will establish and clarify eligibility.

10.4 FAIR SHARE CONTRIBUTION

Project improvements may include a combination of fee payments to established programs, construction of specific improvements, payment of a fair share contribution toward future improvements or a combination of these approaches. Improvements constructed by development may be eligible for a fee credit or reimbursement through the program where appropriate (to be determined at the City's discretion).

When off-site improvements are identified with a minor share of responsibility assigned to proposed development, the approving jurisdiction may elect to collect a fair share contribution or require the development to construct improvements. Detailed fair share calculations, for each peak hour, has been provided on Table 10-2 for the deficient intersections shown on Table 10-1. Improvements included in a defined program and constructed by development may be eligible for a fee credit or reimbursement through the program where appropriate.

Table 10-2

Project Fair Share Calculations

#	Intersection		Existing	Project	2035 WP	Total New Traffic	Project % of New Traffic[1]
4	Pats Ranch Rd. / Limonite Av.						
		AM:	2,055	132	4,840	2,785	4.7%
		PM:	2,819	159	7,227	4,408	**3.6%**
8	Pats Ranch Rd. / 68th St.						
		AM:	1,289	60	2,736	1,447	**4.1%**
		Mid:	1,047	74	2,514	1,467	5.0%
		PM:	909	74	2,096	1,187	6.2%
9	Wineville Av. / Limonite Av.						
		AM:	1,960	30	4,050	2,090	1.4%
		PM:	2,710	37	6,019	3,309	**1.1%**

[1] Project percentage of new traffic between Existing (2014) and Horizon Year (2035) traffic conditions. Fair Share percentage of most impacted peak hour is highlighted.

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11 REFERENCES

1. **Riverside County Transportation Department.** *Traffic Impact Analysis Preparation Guide.* County of Riverside : s.n., Updated April 2008.
2. **Institute of Transportation Engineers.** *Trip Generation.* 9th Edition. 2012.
3. **California Department of Transportation.** *Guide for the Preparation of Traffic Impact Studies.* December 2002.
4. **Transportation Research Board.** *Highway Capacity Manual (HCM).* s.l. : National Academy of Sciences, 2000 and 2010.
5. **Federal Highway Administration.** Manual on Uniform Traffic Control Devices (MUTCD). [book auth.] California Department of Transportation. *California Manual on Uniform Traffic Control Devices (CAMUTCD).* 2012.
6. **Southern California Association of Governments.** *2012 Regional Transportation Plan.* April 2012.
7. **California Department of Transportation.** *Freeway Performance Measurement (PeMS).* [Online] [Cited: January 7, 2014.] http://pems.dot.ca.gov/.
8. **Riverside County Transportation Commission.** I-15 Express Lanes Project. *RCTC.* [Online] http://www.rctc.org/projects/interstate-15/i-15-corridor-improvement-project.
9. **Western Riverside Council of Governments.** *TUMF Nexus Study, 2011 Program Update.* Fall 2011.

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APPENDIX 1.1:

APPROVED TRAFFIC STUDY SCOPING AGREEMENT

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Charlene Hwang So

From: Rob Olson [rolson@jurupavalley.org]
Sent: Tuesday, June 17, 2014 4:29 PM
To: Charlene Hwang So
Subject: RE: JN:09210 Vernola Marketplace Apartments Scoping Agreement Changes

Charlene,

The City agrees to not have the intersection of Etiwanda and Limonite included in the reduced traffic study and that microsimulation analysis for Limonite Avenue between, and inclusive of, the intersections with I-15 Southbound Ramps and Wineville Avenue.

Rob Olson
Transportation Engineer
City of Jurupa Valley
(951)-790-1331 – Public Works / Engineering at Sam's site
(951)-332-6464 – General City Offices
rolson@jurupavalley.org

From: Charlene Hwang So [mailto:cso@urbanxroads.com]
Sent: Tuesday, June 17, 2014 11:10 AM
To: Rob Olson
Subject: JN:09210 Vernola Marketplace Apartments Scoping Agreement Changes
Importance: High

Hi Rob,

Just to summarize our telephone conversation, below are the changes proposed to the approved scoping agreement:

1. As the project has decided to not pursue Phase 2, we will be removing all analysis related to Phase 2 of the project.
2. As the project will contribute fewer than 50 peak hour trips, we will not be analyzing the intersection of Etiwanda and Limonite. Although the intersection of Wineville and Limonite is also anticipated to have fewer than 50 peak hour trips, we will include the intersection for the purposes of evaluating the progression along Limonite per our discussion.
3. We will add a progression analysis for Limonite that includes the freeway ramps to Wineville Avenue.

Regards,
Charlene So, P.E.
Senior Transportation Engineer

URBAN CROSSROADS
Improving Urban Places
IRVINE | CARLSBAD | RIVERSIDE
41 Corporate Park, Suite 300
Irvine, CA 92606
ph: (949) 660-1994 x222
www.urbanxroads.com

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41 Corporate Park | Suite 300 | Irvine, CA 92606 | (949) 660-1994
www.urbanXroads.com

May 23, 2014

Mr. Rob Olson
City of Jurupa Valley
8304 Limonite Avenue, Suite M
Jurupa Valley, CA 92509

SUBJECT: SCOPING AGREEMENT FOR THE VERNOLA MARKETPLACE APARTMENTS TRAFFIC IMPACT ANALYSIS

Dear Mr. Rob Olson:

The firm of Urban Crossroads, Inc. is pleased to submit this scoping agreement for the proposed Vernola Marketplace Apartments ("Project"), which is located west of Pats Ranch Road and north of 68th Street in the City of Jurupa Valley. The Project is proposed to consist of 597 apartments. The Project is anticipated to be developed in two phases as listed below:

- Phase 1 (2016) – 397 units
- Phase 2 (2017) – 200 units for a total of 597 units

Our goal is to obtain comments from City of Jurupa Valley staff, to ensure that the traffic study fully addresses the potential impacts of the proposed Project. The remainder of this letter describes the draft proposed analysis methodology, project trip generation, trip distribution, and project traffic assignment/project trips on the surrounding roadway network, which have been used to establish the draft proposed project study area and analysis locations.

Exhibit 1 depicts the location of the proposed Project in relation to the existing roadway network. The preliminary site plan for the proposed Project is shown on Exhibit 2. It is anticipated that the Project will be built and occupied by Year 2017. Access to the Project site will be provided along 68th Street and Pats Ranch Road (public roads) via the following driveways:

#5: Pats Ranch Road via Driveway 1/65th Street (Full Access)
#6: Pats Ranch Road via Driveway 2 (Full Access)
#7: Pats Ranch Road via Driveway 3/Ivory Street (Full Access)

STUDY AREA

Our understanding is that the City of Jurupa Valley has adopted the County of Riverside's TIA guidelines. The traffic impact study area was defined in conformance with the requirements of the City's TIA guidelines. The minimum area to be studied includes any intersection of General Plan roadways as identified on the City of Jurupa Valley's General Plan Circulation Element at which the

proposed Project will add 50 or more peak hour trips. Exhibit 1 presents the study area intersection analysis locations.

ANALYSIS SCENARIOS

Consistent with City's traffic study guidelines, the analysis of peak hour operations at study area intersections will be provided for the following analysis scenarios:

- Existing (2014) Conditions
- Existing plus Project Conditions – Phase 1
- Existing plus Project Conditions – Phase 2 (Buildout)
- Existing plus Ambient Growth plus Project Conditions – Phase 1 (2016)
- Existing plus Ambient Growth plus Cumulative plus Project Conditions – Phase 1(2016)
- Existing plus Ambient Growth plus Project Conditions – Phase 2 (2017)
- Existing plus Ambient Growth plus Cumulative plus Project Conditions – Phase 2(2017)
- Horizon Year (2035) Without Project
- Horizon Year (2035) With Project

Highway Capacity Manual 2010 methodology will be utilized unless directed otherwise.

A ramp queuing analysis will also be provided for the off-ramps at the I-15 Freeway consistent with other recent projects within the City of Jurupa Valley.

TRIP GENERATION

In order to develop the traffic characteristics of the proposed project, trip-generation statistics published in the Institute of Transportation Engineers (ITE) Trip Generation (9th Edition, 2012) manual for apartment (ITE Land Use Code 220) were utilized. Table 1 presents the trip generation rates and the resulting trip generation based on the intensities associated with the proposed Project.

As shown on Table 1, Phase 1 of the proposed Project is anticipated to generate a total of the proposed development is anticipated to generate a total of 3,970 trip-ends per day on a typical weekday with 304 vehicles per hour (VPH) during the weekday AM peak hour and 370 VPH during the weekday PM peak hour. The PM peak hour trip generation will be utilized for both the mid-day and PM peak hours for the purposes of this analysis.

TRIP DISTRIBUTION

Exhibit 3 illustrates the proposed trip distribution pattern for Phase 1 of the Project. Exhibit 4 illustrates the proposed trip distribution pattern for Phase 2 (Buildout) of the Project.

FREEWAY ANALYSIS

Consistent with Caltrans' guidance on recent work efforts in the region, all freeway segments (mainline) where over 50 Project-generated peak hour trips are added to existing and/or future conditions will be analyzed using the currently accepted Highway Capacity Manual (HCM) basic freeway segment analysis methodologies. As shown on Exhibit 4, the Project is anticipated to contribute more than 50 peak hour trips to freeway segments on the I-15 Freeway adjacent to Limonite Avenue.

Because impacts to freeway segments dissipate with distance from the point of State Highway System (SHS) entry, quantitative study of freeway segment beyond those immediately adjacent to the point of entry is not being proposed. As such, the traffic study will evaluate the following freeway segments:

- I-15 Freeway Southbound, north of Limonite Avenue
- I-15 Freeway Southbound, south of Limonite Avenue
- I-15 Freeway Northbound, north of Limonite Avenue
- I-15 Freeway Northbound, south of Limonite Avenue

Consistent with the freeway segments analyzed, the following merge/diverge ramp junctions will be analyzed as part of this study:

- I-15 Freeway Southbound, Off-Ramp at Limonite Avenue
- I-15 Freeway Southbound, On-Ramp at Limonite Avenue
- I-15 Freeway Northbound, On-Ramp at Limonite Avenue
- I-15 Freeway Northbound, Off-Ramp at Limonite Avenue

LEVEL OF SERVICE (LOS) CRITERIA

CITY OF JURUPA VALLEY AND CITY OF EASTVALE

Consistent with both Cities' traffic study guidelines, the City of Jurupa Valley and the City of Eastvale will maintain the following target level of service (LOS): LOS "C" on all City-maintained roads and conventional State Highways. As an exception, LOS "D" may be allowed in Community Development areas at intersections of any combination of Secondary Highways, Major Highways, Arterial Highways, Urban Arterial Highways, Expressways or conventional State Highways. LOS "E" may be allowed in designated Community Centers to the extent that it would support transit-oriented development and pedestrian communities.

As such, while the remaining study area intersections would have a minimum acceptable LOS of LOS "D", LOS "C" has been considered acceptable at study intersections along Pats Ranch Road.

CALTRANS

For the study intersections under Caltrans jurisdiction, LOS "D" is the minimum acceptable condition that should be maintained during the peak commute hours.

THRESHOLDS OF SIGNIFICANCE

CITY OF JURUPA VALLEY AND CITY OF EASTVALE

For purposes of analyzing California Environmental Quality Act (CEQA) impacts and the City of Jurupa Valley identifies significant impacts through a comparison of Existing (2014) and EAP traffic conditions.

- First, when the pre-Project condition is at or better than the acceptable LOS, and project-generated traffic causes deterioration below the acceptable LOS, a significant impact is deemed to occur.
- However, when the pre-Project condition is already deficient, and the Project is anticipated to contribute traffic, the Project's contribution to the cumulative impact would be cumulatively considerable.

The proposed significance thresholds will be applied at study area intersections for the purposes of determining project-related impacts.

CALTRANS

Impacts to State Highway System (SHS) freeway segments will be considered significant if:

- The traffic study finds that the LOS of a segment will degrade from D or better to E or F.
- The traffic study finds that the project will exacerbate an already deficient condition. A segment that is operating at or near capacity is deemed to be deficient.

EXISTING COUNT DATA

Intersection turning movement counts have been conducted at the study area intersection locations for weekday AM, weekday mid-day, and weekday PM peak hours on May 1, 2014. The weekday AM, mid-day, and PM peak hour count program was conducted prior to the approval of this scope in order collect data before Jurupa Unified School District and Corona-Norco School District schools are let out for summer on May 29, 2014. 24-hour tube counts were also collected at the study area roadway segments list below in order to determine the appropriate peak-to-daily relationship suitable for use within the study area.

- Hamner Avenue, north of 68th Street
- Etiwanda Avenue, north of Limonite Avenue

- Pats Ranch Road, south of 65th Street

In an effort to assess the potential impacts to study area intersections from the adjacent existing school (Louis Vandermolen Fundamental Elementary School), the following study area intersections will be evaluated for the weekday AM, mid-day and PM peak hours:

#1: Hamner Avenue / 68th Street
#5: Pats Ranch Road / Driveway 1/65th Street
#6: Pats Ranch Road / Driveway 2
#7: Pats Ranch Road / Driveway 3/Ivory Street
#8: Pats Ranch Road / 68th Street

In an effort to conduct the most conservative analysis, the mid-day peak period between 1:00 to 3:00 PM will be counted in order to capture the peak egress of the adjacent schools. The remaining study area intersections will only be evaluated for the weekday AM and PM peak hours only.

CUMULATIVE DEVELOPMENT PROJECTS

There is a list of cumulative projects provided on Table 2 (also shown graphically on Exhibit 5) and is consistent with the cumulative lists on other recent projects near the Project site. It is requested that the list of cumulative development projects be reviewed by the City and projects be removed/added, where applicable.

For any new cumulative projects, it is requested that information necessary to determine trip generation and trip distribution patterns for each project be provided (e.g., location, land use, quantity, etc.).

If you have any questions, please contact me directly at (949) 660-1994, extension 222.

Respectfully submitted,

URBAN CROSSROADS, INC.

Recommended By:

Charlene So

Charlene So, P.E., Urban Crossroads, Inc.

Approved By:

Rob Olson, City of Jurupa Valley

EXHIBIT 1: LOCATION MAP

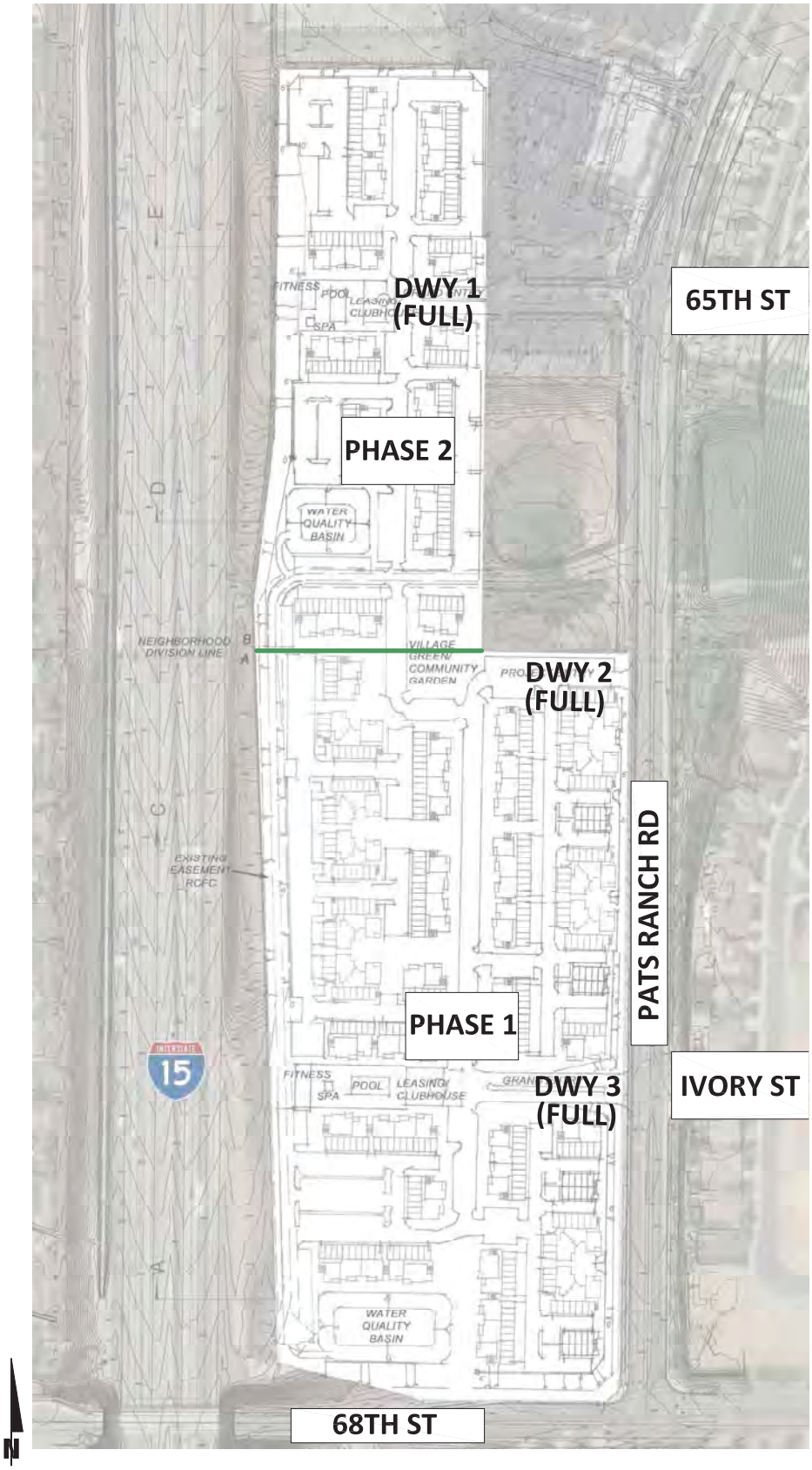
LEGEND:

0 = EXISTING INTERSECTION ANALYSIS LOCATION

0 = FUTURE INTERSECTION ANALYSIS LOCATION

N

EXHIBIT 2: PRELIMINARY SITE PLAN

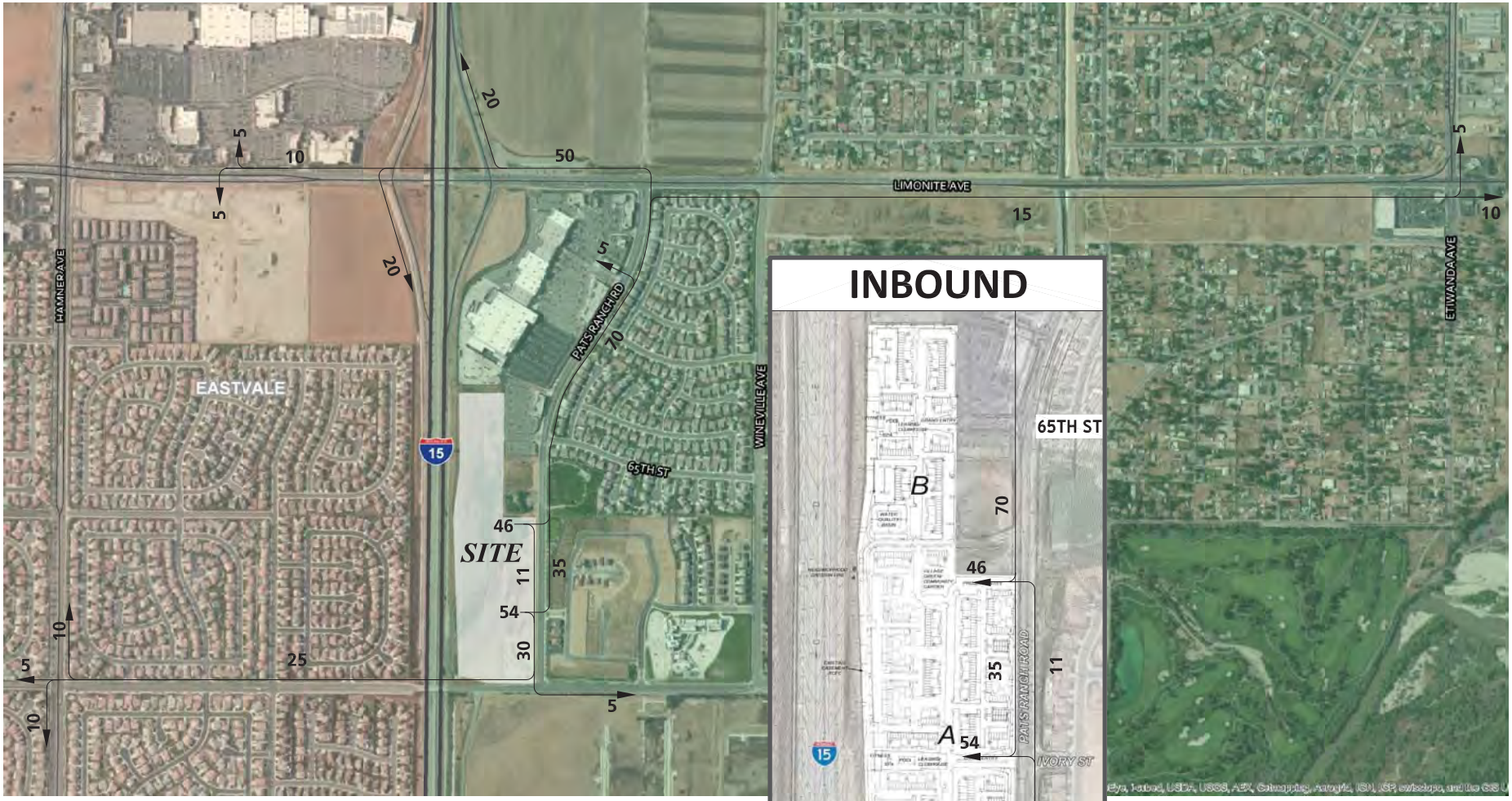


LEGEND:

PHASE 1 (2016) -397 UNITS
PHASE 2 (2017) -200 UNITS
FULL = FULL ACCESS

09210 - site plan.dwg

EXHIBIT 3: PROJECT PHASE 1 TRIP DISTRIBUTION

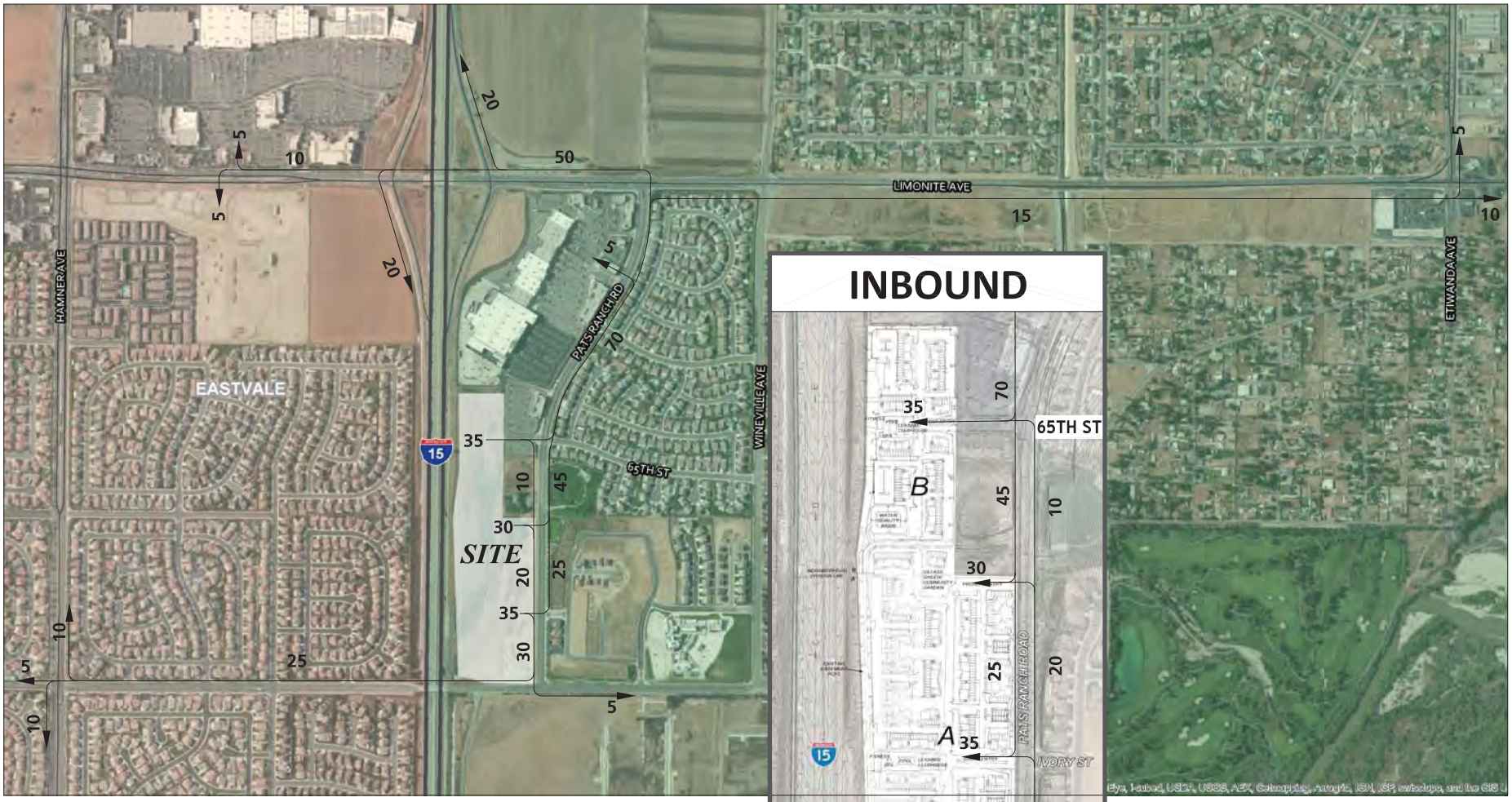


LEGEND:

10 = PERCENT TO/FROM PROJECT

N

EXHIBIT 4: PROJECT BUILDOUT TRIP DISTRIBUTION



URBAN CROSSROADS

EXHIBIT 5: CUMULATIVE DEVELOPMENT PROJECTS LOCATION MAP

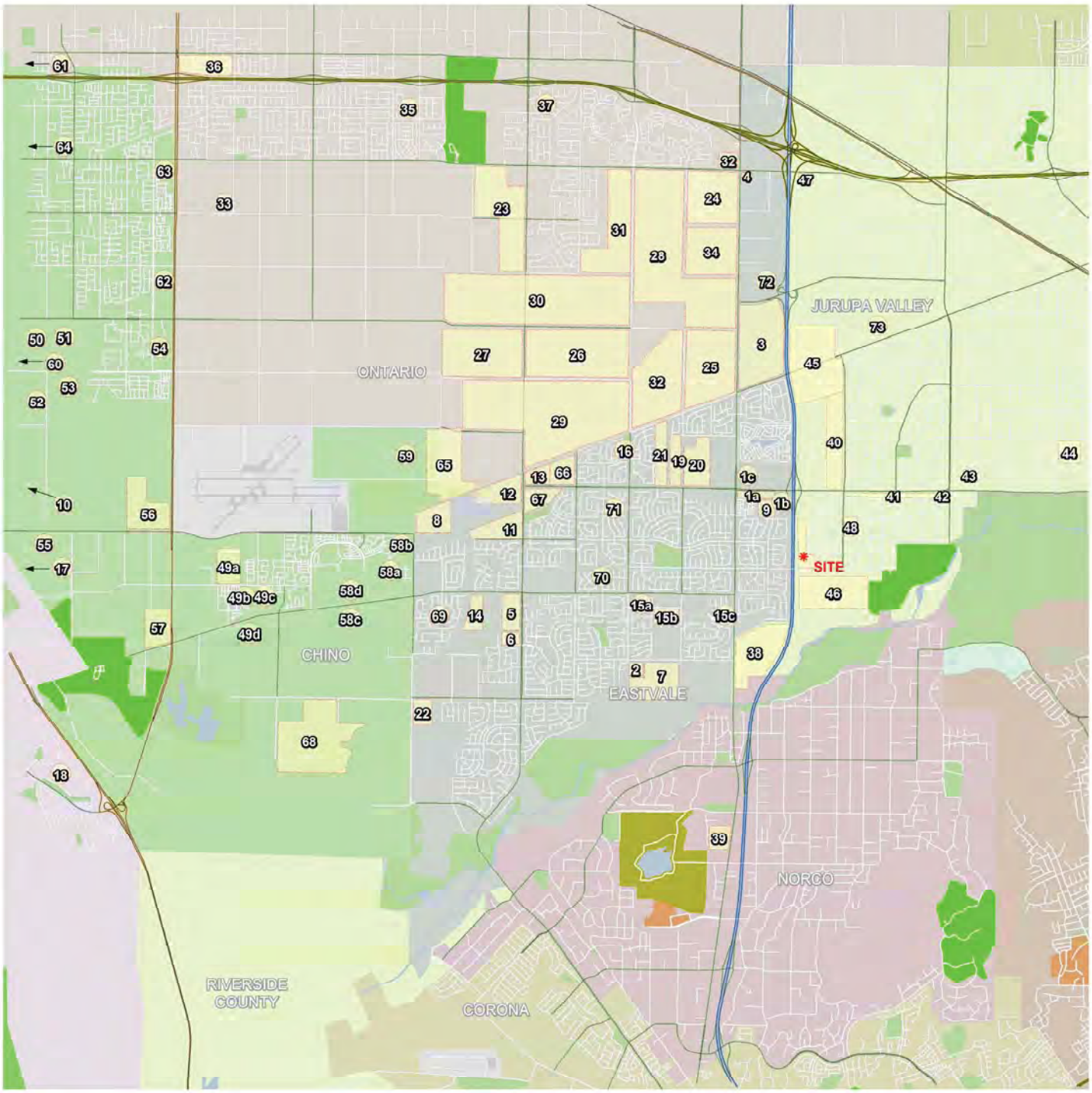


Table 1

Project Trip Generation Rates[1]

Land Use	ITE Code	Units[2]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Apartments	220	DU	0.10	0.41	0.51	0.40	0.22	0.62	6.65

Project Trip Generation Summary

Land Use	Quantity	Units[2]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Phase 1 (2016)	397	DU	40	163	202	159	87	246	2,640
Phase 2 (2017)	200	DU	20	82	102	80	44	124	1,330
Total			**60**	**245**	**304**	**239**	**131**	**370**	**3,970**

[1] Source: ITE (Institute of Transportation Engineers) Trip Generation Manual, 9th Edition, 2012.

[2] DU = Dwelling Units

Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
1A	Eastvale Gateway South	Shopping Center	20.132	TSF
1B	14-0046 - Kasbergen/William Lyons Homes	Condo/Townhouse	220	DU
1C	14-0032 - Tio's Mexican Restaurant	High-Turnover (Sit-Down) Restaurant	2.411	TSF
2	10-0117 (TM36373)	SFDR	51	DU
3	10-0271 - Eastvale Commerce Center (Phase 1 and 2)	Shopping Center	249.000	TSF
		Hotel	130	RM
		High Cube Warehouse	3,100.000	TSF
		Business Park	610.000	TSF
4	11-0354 - Arco Gas Station	Gas Station w/ convenience store and car wash	18.000	VFP
		Fast-Food w/o Drive-Thru	2.800	TSF
		Fast-Food with Drive-Thru	2.100	TSF
5	The Marketplace at Enclave	Coffee/Donut Shop w/ Drive Thru	1.600	TSF
		Shopping Center	82.671	TSF
6	TR30896	SFDR	73	DU
7	11-0363 TTM 36382 (Altfillisch Residential Project[5])	SFDR	146	DU
8	SP00358 - The Ranch at Eastvale	Shopping Center	267.200	TSF
		General Light Industrial	801.500	TSF
		Business Park	1,121.100	TSF
9	11-0366 - Eastvale South[3]	Medical-Dental Office Building	70.000	TSF
10	Country Club Villas	Condo/Townhouse	46	DU
	Lago Los Serranos	Condo/Townhouse	95	DU
	The Commons	Shopping Center	150.000	DU
11	13-0395- 65th Street Residential (Copper Sky)	SFDR	250	DU
12	PP23219 (PM35865)	General Light Industrial	738.430	TSF
13	TR32797	SFDR	119	DU
14	TR35751	Condo/Townhouse	243	DU
15A	13-0632 - Sumner Residential (Stratham Homes)	SFDR	129	DU
15B	11-0558 - TR34014 (The Trails)	SFDR	224	DU
15C	13-1601 - 99 Cent Store	Discount Store		TSF
16	CUP 03482	Shopping Center	75.759	TSF
17	The Golden Triangle	Shopping Center	106.700	TSF
	Heritage Professional Center	Hospital	55.000	TSF
		Medical Office Building	86.952	TSF
		Hotel	120	RM
		Shopping Center	38.848	TSF
		Restaurant	7.200	TSF
	Vista Bella Townhomes	Condo/Townhouse	65	DU
	Higgins Business Park	Business Park	338.682	TSF
		General Office	40.000	TSF
		Specialty Retail	10.000	TSF
		Bank with Drive-Thru	3.000	TSF
		Fast-Food with Drive-Thru	3.000	TSF
		Gas Station w/ convenience store and car wash	10	VFP
18	Vila Borba Specific Plan	SFDR	351	DU
19	TR32821	Condo/Townhouse	350	DU
20	TR32909	SFDR	140	DU
21	10-0124 - TR31252 (The Lodge)	SFDR	205	DU
22	TR29997	SFDR	122	DU
		Shopping Center	124.360	TSF
23	Countryside	SFDR	819	DU

Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
24	Edenglen	SFDR	310	DU
		Multi-Family Attached (Condo)	274	DU
		Shopping Center	217.520	TSF
		Business Park	550.000	TSF
25	Esperanza	SFDR	914	DU
		Multi-Family Attached (Apartments)	496	DU
26	Grand Park	SFDR	484	DU
		Multi-Family Attached (Apartments)	843	DU
27	Parkside	SFDR	437	DU
		Multi-Family Attached (Apartments)	1,510	DU
		Shopping Center	115.000	TSF
28	Rich Haven	SFDR	2,732	DU
		Multi-Family Attached (Condo)	1,524	DU
		Shopping Center	848.200	TSF
29	Subarea 29 & Ammendment	SFDR	2,865	DU
		Shopping Center	87.000	TSF
30	The Avenue	SFDR	2,020	DU
		Multi-Family Attached (Apartments)	586	DU
		Shopping Center	250.000	TSF
31	West Haven	SFDR	753	DU
		Shopping Center	87.000	TSF
32	Tuscana Village	SFDR	176	DU
		Shopping Center	26.000	TSF
33	PDEV10-011	SFDR	11	DU
34	PDEV10-008 - Dry Food Storage	Mini-Warehouse	17.000	TSF
35	PDEV06-036 - Phase 3	Shopping Center	28.000	TSF
36	PDEV07-050	Shopping Center	36.324	TSF
37	PDEV08-008	Shopping Center	3.920	TSF
38	Silverlakes Equestrian[6]	Soccer Field	14	Fields
		Soccer Field	10	Fields
		Equestrian Facility	400	Stalls
39	Fairfield Inn Hotel	Hotel	96	RM
		High-Turnover (Sit-Down) Restaurant	10.000	TSF
40	TR33428	SFDR	338	DU
41	TR33258	SFDR	45	DU
42	CUP03555	Mini-Warehouse	141.460	TSF
43	CUP03488 (Self Storage)	Mini-Warehouse	89.642	TSF
44	TR35655	SFDR	9	DU
45	TR31644	SFDR	213	DU
	TR31768	SFDR	95	DU
	TR31778	SFDR	64	DU
	TR33461	SFDR	102	DU
	Thorobred Farms	High-Cube Warehouse	1,176.120	TSF
46	Ter Maaten (TTM No. 36391)	SFDR	468	DU
		Park	8.4	AC
47	Riverside Drive Development	General Light Industrial	167.020	TSF
48	6316 Wineville Av. (Daycare)	Daycare	40	Students
49a	Bickmore Street Residential	SFDR	196	DU
49b	TM 17611	SFDR	21	DU

Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
49c	TM 17612	SFDR	42	DU
49d	Barthelemy Project	SFDR	200	DU
50	PL11-0047	Apartments	135	DU
	TM 18873	Condo/Townhouse	149	DU
	TM 16838-2 PA 7B	SFDR	67	DU
51	TM17898	SFDR	77	DU
	TM 17899	SFDR	66	DU
	PL 13-0435	SFDR	41	DU
52	TM18848	Condo/Townhouse	101	DU
53	TM17891	SFDR	75	DU
54	PL11-0299	General Light Industrial	50.000	TSF
	PL13-0601	SFDR	209	DU
55	PL10-0544	General Light Industrial	303.300	TSF
56	Majestic Airport Center	High-Cube Warehouse	2,890.400	TSF
		Warehousing	180.000	TSF
		Specialty Retail	25.000	TSF
		Pharmacy/Drugstore with Drive-Thru	13.000	TSF
		Fast-Food with Drive-Thru	8.600	TSF
	Chino West Industrial	Warehousing	127.052	TSF
		High-Cube Warehouse	942.325	TSF
57	PM18635	General Light Industrial	99.164	TSF
		High-Cube Warehouse	2,077.594	TSF
58a	TM16420-1	Apartments	799	DU
58b	TM 18890	Condo/Townhouse	94	DU
58c	Lewis Residential	Apartments	800	DU
58d	Falloncrest at the Preserve	SFDR	204	DU
		Condo/Townhouse	786	DU
		Apartments	412	DU
		Shopping Center	77.597	TSF
		General Office	77.597	TSF
59	PM19368 (Chino East Industrial)	General Light Industrial	1,593.500	TSF
60	PL 08-0334	Manufacturing	421.031	TSF
	Hillwood @ Monte Vista Av./Schaefer Av.	Industrial	409.000	TSF
	PL 10-0726	General Office	13.672	TSF
61	TM 18880	SFDR	33	DU
	SEC Philadephia/Ramona	Shopping Center	27.000	TSF
	Chino Central Residential (PL13-0618)	SFDR	94	DU
	Central and Francis Residential	SFDR	113	DU
	Pipeline and Norton Residential	SFDR	45	DU
62	Brewart Residential	SFDR	127	DU
63	Fern and Riverside Residential	SFDR	94	DU
64	Chino Riverside Residential	SFDR	59	DU
	Borba Chino Residential	SFDR	84	DU
65	Watson Commerce Center	High-Cube Warehouse	3,706.740	TSF
66	SC Limonite, LLC	SFDR	318	DU

Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
67	Eastvale Walmart	Free-Standing Discount Superstore	192.000	TSF
		Specialty Retail	9.200	TSF
		Fast-Food Without Drive-Thru	7.200	TSF
		Coffee/Donut Shop w/ Drive Thru	2.000	TSF
		Fast-Food with Drive-Thru	3.500	TSF
		Gas Station w/ convenience store and car wash	16	VFP
68	Edgewater Communities	SFDR	415	DU
		Condo/Townhouse	659	DU
		Museum/Retail	6.500	TSF
		Church	15.200	TSF
		Park	15.0	AC
69	14-0081 - LFDC Large Family Day Care (Itsy Bitsy Depot)	Daycare	14	Students
70	14-0631 - LFDC Large Family Day Care (Eaton Family Day Care)	Daycare	14	Students
71	14-0783 - LFDC Large Family Day Care (Ling Family Day Care)	Daycare	14	Students
72	14-1077 - Grainger Site (APN:156-050-025, 156-050-026, 156-020-027)	Industrial	546.000	TSF
73	TR36692	SFDR		DU
	TR31768	SFDR		DU
	TR31778-1	SFDR		DU
	TR33461	SFDR		DU
	TR31644	SFDR		DU
	TR31644-1	SFDR		DU

[1] SFDR = Single Family Detached Residential

[2] TSF = Ten Thousand Square Feet; DU = Dwelling Unit; VFP = Vehicle Fueling Position; AC = Acres

[3] Source: Eastvale South Trip Generation Analysis, Albert A. Webb Associates, May 27, 2011

[4] Source: Trip Generation Comparison for Cloverdale Marketplace, Phase II, Eastvale CA, Albert A. Webb Associates, August 15, 2011.

[5] Source: Altfillisch Residential Project TIA Memorandum, LSA Associates, Inc., July 25, 2011.

[6] Source: From Silverlakes TIA (Revised), Kunzman Associates, September 25, 2008.

APPENDIX 3.1:

EXISTING TRAFFIC COUNTS – MAY 2014

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Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Eastvale
N/S: Hamner Avenue
E/W: 68th Street
Weather: Clear

File Name : ESVHA68AM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- Total Volume

	Hamner Avenue Southbound					68th Street Westbound					Hamner Avenue Northbound					68th Street Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	8	122	7	4	137	46	36	22	12	104	6	121	23	0	150	24	32	13	8	69	24	460	484
07:15 AM	19	159	10	7	188	84	52	17	4	153	14	139	41	26	194	26	54	27	4	107	41	642	683
07:30 AM	13	123	11	4	147	61	37	19	5	117	17	190	57	25	264	39	49	26	3	114	37	642	679
07:45 AM	11	93	10	3	114	32	45	20	11	97	8	196	30	11	234	19	40	10	3	69	28	514	542
Total	51	497	38	18	586	223	170	78	32	471	45	646	151	62	842	108	175	76	18	359	130	2258	2388
08:00 AM	12	86	10	5	108	25	33	26	14	84	5	139	43	22	187	27	33	11	4	71	45	450	495
08:15 AM	10	88	8	3	106	38	43	15	4	96	3	128	22	16	153	27	28	18	7	73	30	428	458
08:30 AM	8	111	6	3	125	29	19	7	4	55	10	124	34	16	168	26	35	5	2	66	25	414	439
08:45 AM	4	98	7	2	109	34	18	10	4	62	8	133	27	15	168	10	21	11	8	42	29	381	410
Total	34	383	31	13	448	126	113	58	26	297	26	524	126	69	676	90	117	45	21	252	129	1673	1802
Grand Total	85	880	69	31	1034	349	283	136	58	768	71	1170	277	131	1518	198	292	121	39	611	259	3931	4190
Apprch %	8.2	85.1	6.7			45.4	36.8	17.7			4.7	77.1	18.2			32.4	47.8	19.8					
Total %	2.2	22.4	1.8		26.3	8.9	7.2	3.5		19.5	1.8	29.8	7		38.6	5	7.4	3.1		15.5	6.2	93.8	

	Hamner Avenue Southbound				68th Street Westbound				Hamner Avenue Northbound				68th Street 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 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	8	122	7	137	46	36	**22**	104	6	121	23	150	24	32	13	69	460
07:15 AM	**19**	**159**	10	**188**	**84**	**52**	17	**153**	14	139	41	194	26	**54**	**27**	107	**642**
07:30 AM	13	123	**11**	147	61	37	19	117	**17**	190	**57**	**264**	**39**	49	26	**114**	642
07:45 AM	11	93	10	114	32	45	20	97	8	**196**	30	234	19	40	10	69	514
Total Volume	51	497	38	586	223	170	78	471	45	646	151	842	108	175	76	359	2258
% App. Total	8.7	84.8	6.5		47.3	36.1	16.6		5.3	76.7	17.9		30.1	48.7	21.2		
PHF	.671	.781	.864	.779	.664	.817	.886	.770	.662	.824	.662	.797	.692	.810	.704	.787	.879

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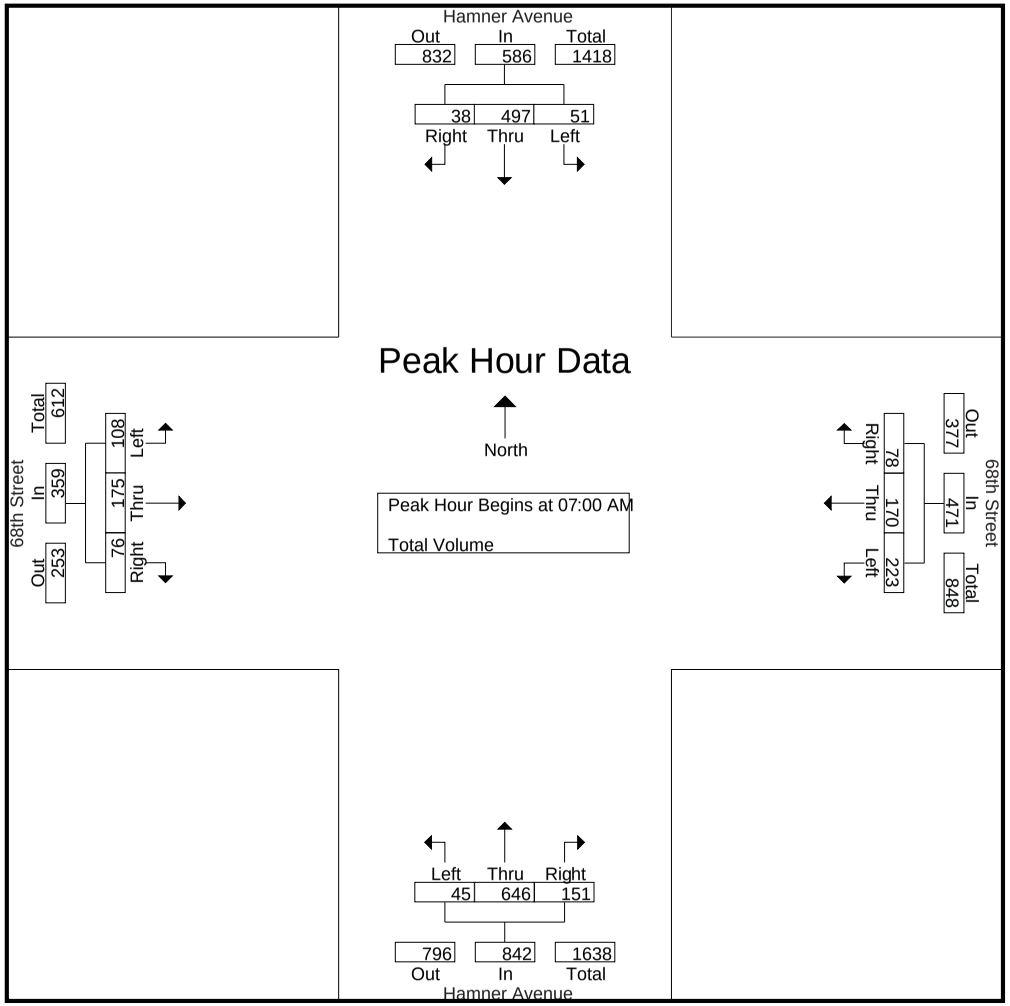
City of Eastvale
N/S: Hamner Avenue
E/W: 68th Street
Weather: Clear

File Name : ESVHA68AM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



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City of Eastvale
N/S: Hamner Avenue
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File Name : ESVHA68AM
Site Code : 05114187
Start Date : 5/1/2014

	Hamner Avenue Southbound				68th Street Westbound				Hamner Avenue Northbound				68th Street 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 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:00 AM				07:00 AM				07:15 AM				07:15 AM				
+0 mins.	8	122	7	137	46	36	**22**	104	14	139	41	194	26	**54**	**27**	107	
+15 mins.	**19**	**159**	10	**188**	**84**	**52**	17	**153**	**17**	190	**57**	**264**	**39**	49	26	**114**	
+30 mins.	13	123	**11**	147	61	37	19	117	8	**196**	30	234	19	40	10	69	
+45 mins.	11	93	10	114	32	45	20	97	5	139	43	187	27	33	11	71	
Total Volume	51	497	38	586	223	170	78	471	44	664	171	879	111	176	74	361	
% App. Total	8.7	84.8	6.5		47.3	36.1	16.6		5	75.5	19.5		30.7	48.8	20.5		
PHF	.671	.781	.864	.779	.664	.817	.886	.770	.647	.847	.750	.832	.712	.815	.685	.792	

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City of Eastvale
N/S: Hamner Avenue
E/W: 68th Street
Weather: Clear

File Name : ESVHA68MD
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- Total Volume

	Hamner Avenue Southbound					68th Street Westbound					Hamner Avenue Northbound					68th Street Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
01:00 PM	8	96	11	4	115	23	14	12	7	49	8	123	21	0	152	14	15	5	2	34	13	350	363
01:15 PM	9	104	18	7	131	27	15	11	4	53	11	141	31	11	183	14	11	7	3	32	25	399	424
01:30 PM	15	123	10	5	148	32	17	6	6	55	8	106	28	14	142	8	13	10	6	31	31	376	407
01:45 PM	12	103	19	5	134	20	14	13	6	47	9	138	37	19	184	9	16	7	1	32	31	397	428
Total	44	426	58	21	528	102	60	42	23	204	36	508	117	44	661	45	55	29	12	129	100	1522	1622
02:00 PM	5	115	15	1	135	24	30	11	5	65	9	145	61	17	215	12	17	8	5	37	28	452	480
02:15 PM	15	130	22	9	167	49	49	26	14	124	13	147	30	18	190	8	26	8	2	42	43	523	566
02:30 PM	13	136	16	3	165	44	37	15	9	96	11	147	38	17	196	21	23	11	0	55	29	512	541
02:45 PM	12	156	18	3	186	40	27	20	10	87	16	192	53	20	261	15	25	11	3	51	36	585	621
Total	45	537	71	16	653	157	143	72	38	372	49	631	182	72	862	56	91	38	10	185	136	2072	2208
Grand Total	89	963	129	37	1181	259	203	114	61	576	85	1139	299	116	1523	101	146	67	22	314	236	3594	3830
Apprch %	7.5	81.5	10.9			45	35.2	19.8			5.6	74.8	19.6			32.2	46.5	21.3					
Total %	2.5	26.8	3.6		32.9	7.2	5.6	3.2		16	2.4	31.7	8.3		42.4	2.8	4.1	1.9		8.7	6.2	93.8	

	Hamner Avenue Southbound				68th Street Westbound				Hamner Avenue Northbound				68th Street 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 01:00 PM to 02:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:00 PM																	
02:00 PM	5	115	15	135	24	30	11	65	9	145	**61**	215	12	17	8	37	452
02:15 PM	**15**	130	**22**	167	**49**	**49**	**26**	**124**	13	147	30	190	8	**26**	8	42	523
02:30 PM	13	136	16	165	44	37	15	96	11	147	38	196	**21**	23	**11**	**55**	512
02:45 PM	12	**156**	18	**186**	40	27	20	87	**16**	**192**	53	**261**	15	25	11	51	**585**
Total Volume	45	537	71	653	157	143	72	372	49	631	182	862	56	91	38	185	2072
% App. Total	6.9	82.2	10.9		42.2	38.4	19.4		5.7	73.2	21.1		30.3	49.2	20.5		
PHF	.750	.861	.807	.878	.801	.730	.692	.750	.766	.822	.746	.826	.667	.875	.864	.841	.885

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City of Eastvale
N/S: Hamner Avenue
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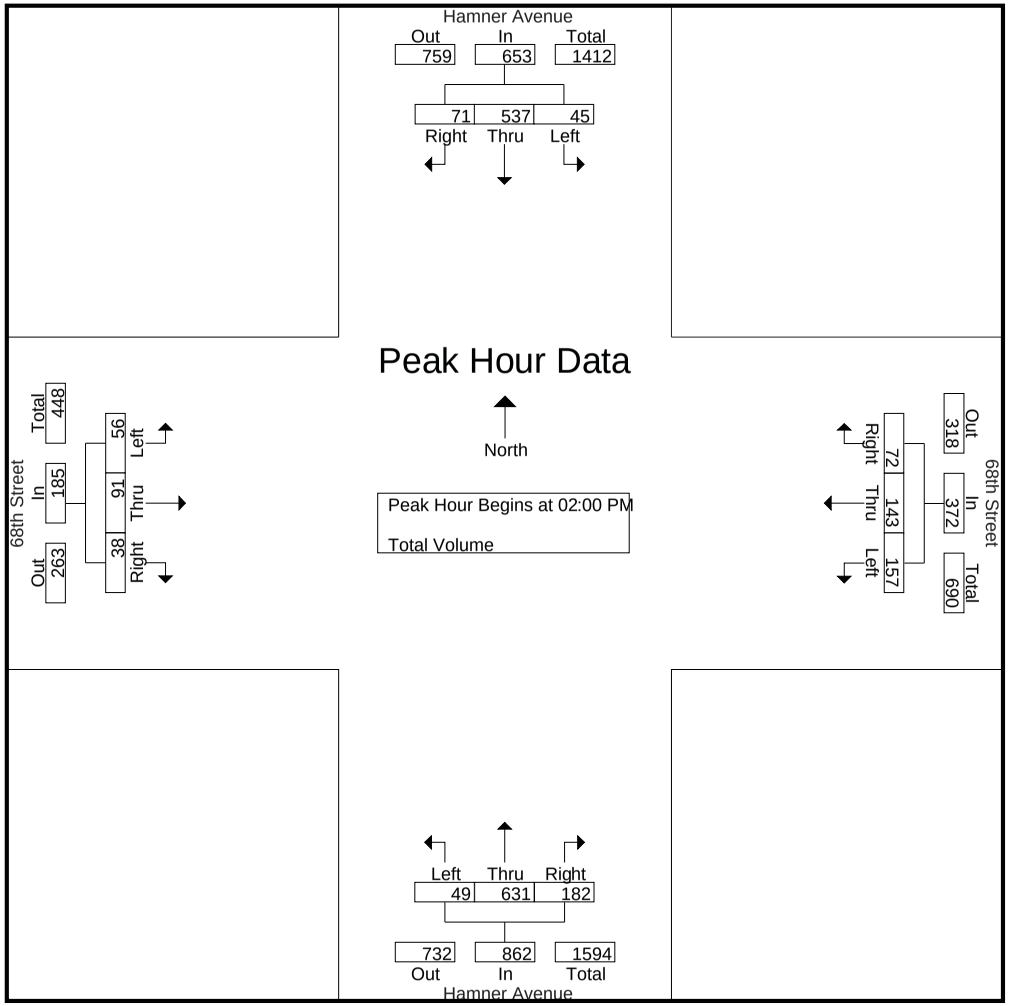
File Name : ESVHA68MD
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



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City of Eastvale
N/S: Hamner Avenue
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File Name : ESVHA68MD
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Start Date : 5/1/2014

	Hamner Avenue Southbound				68th Street Westbound				Hamner Avenue Northbound				68th Street 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 01:00 PM to 02:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	02:00 PM				02:00 PM				02:00 PM				02:00 PM				
+0 mins.	5	115	15	135	24	30	11	65	9	145	**61**	215	12	17	8	37	
+15 mins.	**15**	130	**22**	167	**49**	**49**	**26**	**124**	13	147	30	190	8	**26**	8	42	
+30 mins.	13	136	16	165	44	37	15	96	11	147	38	196	**21**	23	**11**	**55**	
+45 mins.	12	**156**	18	**186**	40	27	20	87	**16**	**192**	53	**261**	15	25	11	51	
Total Volume	45	537	71	653	157	143	72	372	49	631	182	862	56	91	38	185	
% App. Total	6.9	82.2	10.9		42.2	38.4	19.4		5.7	73.2	21.1		30.3	49.2	20.5		
PHF	.750	.861	.807	.878	.801	.730	.692	.750	.766	.822	.746	.826	.667	.875	.864	.841	

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City of Eastvale
N/S: Hamner Avenue
E/W: 68th Street
Weather: Clear

File Name : ESVHA68PM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- Total Volume

	Hamner Avenue Southbound					68th Street Westbound					Hamner Avenue Northbound					68th Street Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	21	160	17	9	198	28	19	8	6	55	11	164	25	0	200	19	21	5	2	45	17	498	515
04:15 PM	19	147	19	7	185	27	25	17	9	69	11	173	56	23	240	7	28	12	5	47	44	541	585
04:30 PM	14	153	18	7	185	38	33	11	5	82	9	148	43	19	200	16	22	5	3	43	34	510	544
04:45 PM	15	150	19	10	184	38	22	21	14	81	14	180	44	23	238	11	24	9	3	44	50	547	597
Total	69	610	73	33	752	131	99	57	34	287	45	665	168	65	878	53	95	31	13	179	145	2096	2241
05:00 PM	19	120	22	8	161	37	32	21	9	90	12	151	52	20	215	18	24	10	4	52	41	518	559
05:15 PM	22	167	13	8	202	32	21	17	8	70	19	173	41	16	233	15	30	10	2	55	34	560	594
05:30 PM	27	143	15	10	185	38	30	20	10	88	25	138	52	20	215	8	28	6	2	42	42	530	572
05:45 PM	28	131	10	8	169	54	46	18	11	118	13	174	43	21	230	15	24	8	3	47	43	564	607
Total	96	561	60	34	717	161	129	76	38	366	69	636	188	77	893	56	106	34	11	196	160	2172	2332
Grand Total	165	1171	133	67	1469	292	228	133	72	653	114	1301	356	142	1771	109	201	65	24	375	305	4268	4573
Apprch %	11.2	79.7	9.1			44.7	34.9	20.4			6.4	73.5	20.1			29.1	53.6	17.3					
Total %	3.9	27.4	3.1		34.4	6.8	5.3	3.1		15.3	2.7	30.5	8.3		41.5	2.6	4.7	1.5		8.8	6.7	93.3	

	Hamner Avenue Southbound				68th Street Westbound				Hamner Avenue Northbound				68th Street 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	19	120	**22**	161	37	32	**21**	90	12	151	**52**	215	**18**	24	**10**	52	518
05:15 PM	22	**167**	13	**202**	32	21	17	70	19	173	41	**233**	15	**30**	10	**55**	560
05:30 PM	27	143	15	185	38	30	20	88	**25**	138	52	215	8	28	6	42	530
05:45 PM	**28**	131	10	169	**54**	**46**	18	**118**	13	**174**	43	230	15	24	8	47	**564**
Total Volume	96	561	60	717	161	129	76	366	69	636	188	893	56	106	34	196	2172
% App. Total	13.4	78.2	8.4		44	35.2	20.8		7.7	71.2	21.1		28.6	54.1	17.3		
PHF	.857	.840	.682	.887	.745	.701	.905	.775	.690	.914	.904	.958	.778	.883	.850	.891	.963

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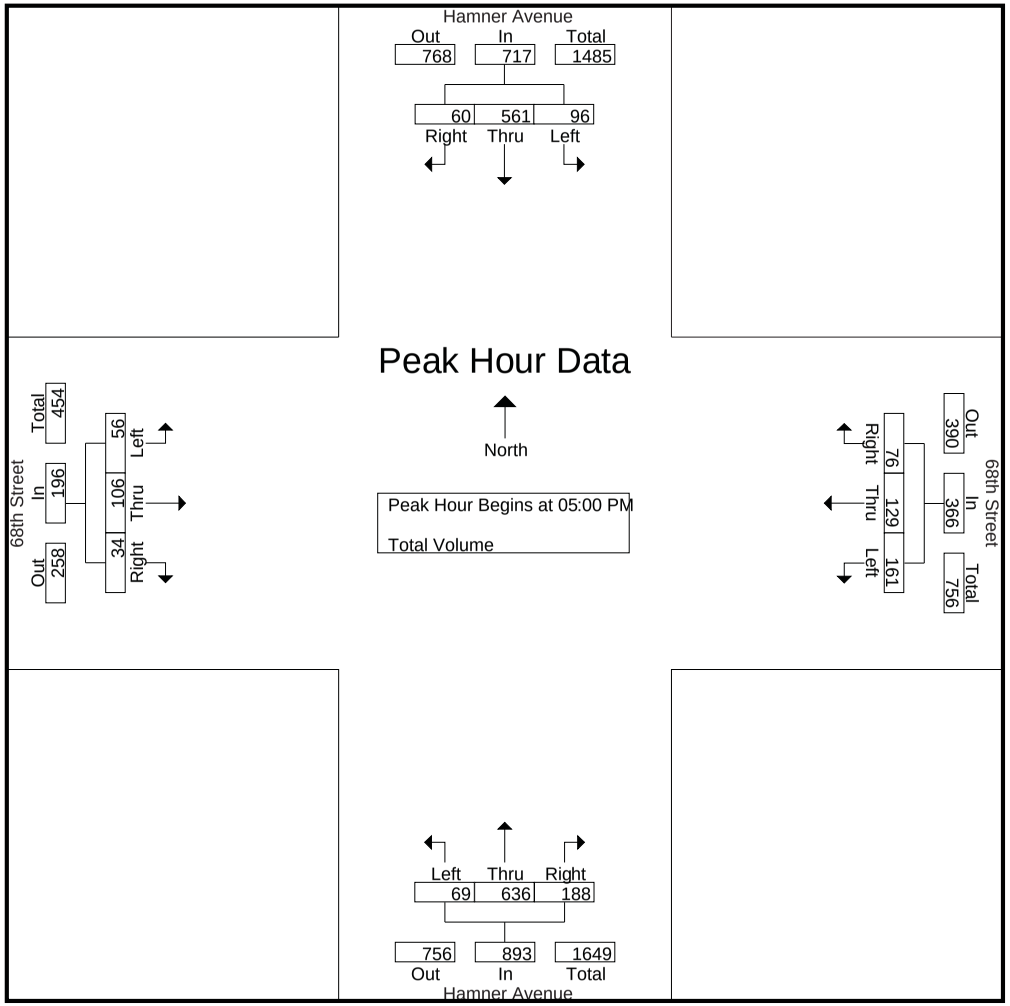

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File Name : ESVHA68PM
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Start Date : 5/1/2014

	Hamner Avenue Southbound				68th Street Westbound				Hamner Avenue Northbound				68th Street 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	04:00 PM				05:00 PM				04:45 PM				05:00 PM				
+0 mins.	**21**	**160**	17	**198**	37	32	**21**	90	14	**180**	44	**238**	**18**	24	**10**	52	
+15 mins.	19	147	**19**	185	32	21	17	70	12	151	**52**	215	15	**30**	10	**55**	
+30 mins.	14	153	18	185	38	30	20	88	19	173	41	233	8	28	6	42	
+45 mins.	15	150	19	184	**54**	**46**	18	**118**	**25**	138	52	215	15	24	8	47	
Total Volume	69	610	73	752	161	129	76	366	70	642	189	901	56	106	34	196	
% App. Total	9.2	81.1	9.7		44	35.2	20.8		7.8	71.3	21		28.6	54.1	17.3		
PHF	.821	.953	.961	.949	.745	.701	.905	.775	.700	.892	.909	.946	.778	.883	.850	.891	

Location: Eastvale
N/S: Hamner Avenue
E/W: 68th Street

Date: 5/1/2014
Weather: Clear

WEEKDAY

	North Leg Hamner Avenue	East Leg 68th Street	South Leg Hamner Avenue	West Leg 68th Street	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
7:00 AM	0	2	0	0	2
7:15 AM	0	0	0	1	1
7:30 AM	0	0	0	1	1
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	2	1	0	0	3
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	2	3	0	2	7

	North Leg Hamner Avenue	East Leg 68th Street	South Leg Hamner Avenue	West Leg 68th Street	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
1:00 PM	0	0	0	0	0
1:15 PM	0	0	0	0	0
1:30 PM	0	0	0	0	0
1:45 PM	2	1	0	2	5
2:00 PM	2	0	0	2	4
2:15 PM	0	0	0	0	0
2:30 PM	0	0	0	0	0
2:45 PM	0	0	0	0	0
TOTAL VOLUMES:	4	1	0	4	9

	North Leg Hamner Avenue	East Leg 68th Street	South Leg Hamner Avenue	West Leg 68th Street	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	1	0	1
4:30 PM	0	0	1	0	1
4:45 PM	1	0	0	0	1
5:00 PM	0	0	0	0	0
5:15 PM	1	0	0	0	1
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	2	0	2	0	4

Location: Eastvale
N/S: Hamner Avenue
E/W: 68th Street

Date: 5/1/2014
Weather: Clear

WEEKDAY

	North Leg Hamner Avenue	East Leg 68th Street	South Leg Hamner Avenue	West Leg 68th Street	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
7:00 AM	0	3	1	0	4
7:15 AM	0	2	0	0	2
7:30 AM	0	3	0	0	3
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	1	1
8:15 AM	0	0	1	0	1
8:30 AM	0	0	1	0	1
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	8	3	1	12

	North Leg Hamner Avenue	East Leg 68th Street	South Leg Hamner Avenue	West Leg 68th Street	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
1:00 PM	0	0	1	0	1
1:15 PM	1	0	0	0	1
1:30 PM	0	0	0	0	0
1:45 PM	0	0	0	0	0
2:00 PM	0	1	0	0	1
2:15 PM	0	0	0	0	0
2:30 PM	0	0	0	0	0
2:45 PM	0	1	2	0	3
TOTAL VOLUMES:	1	2	3	0	6

	North Leg Hamner Avenue	East Leg 68th Street	South Leg Hamner Avenue	West Leg 68th Street	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
4:00 PM	0	1	0	0	1
4:15 PM	0	0	1	1	2
4:30 PM	0	0	0	0	0
4:45 PM	0	1	1	0	2
5:00 PM	0	0	1	0	1
5:15 PM	0	2	0	0	2
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	4	3	1	8

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Corona, CA 92878
(951) 268-6268

City of Eastvale
N/S: I-15 Southbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : ESV15SLIAM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	I-15 Southbound Off Ramp Southbound					Limonite Avenue Westbound					I-15 Southbound On Ramp Northbound					Limonite Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	25	0	134	77	159	135	142	0	0	277	0	0	0	0	0	0	224	95	17	319	94	755	849
07:15 AM	25	0	92	56	117	155	132	0	0	287	0	0	0	0	0	0	253	110	19	363	75	767	842
07:30 AM	31	0	86	42	117	149	150	0	0	299	0	0	0	0	0	0	261	112	5	373	47	789	836
07:45 AM	37	0	116	59	153	138	144	0	0	282	0	0	0	0	0	0	223	106	11	329	70	764	834
Total	118	0	428	234	546	577	568	0	0	1145	0	0	0	0	0	0	961	423	52	1384	286	3075	3361
08:00 AM	33	0	76	50	109	113	137	0	0	250	0	0	0	0	0	0	240	103	22	343	72	702	774
08:15 AM	28	0	91	75	119	111	151	0	0	262	0	0	0	0	0	0	250	91	18	341	93	722	815
08:30 AM	45	0	82	39	127	118	170	0	0	288	0	0	0	0	0	0	234	79	11	313	50	728	778
08:45 AM	35	0	112	51	147	119	163	0	0	282	0	0	0	0	0	0	173	76	15	249	66	678	744
Total	141	0	361	215	502	461	621	0	0	1082	0	0	0	0	0	0	897	349	66	1246	281	2830	3111
Grand Total	259	0	789	449	1048	1038	1189	0	0	2227	0	0	0	0	0	0	1858	772	118	2630	567	5905	6472
Apprch %	24.7	0	75.3			46.6	53.4	0			0	0	0			0	70.6	29.4					
Total %	4.4	0	13.4		17.7	17.6	20.1	0		37.7	0	0	0		0	0	31.5	13.1		44.5	8.8	91.2	
Passenger Vehicles	242	0	755		1432	986	1106	0		2092	0	0	0		0	0	1790	744		2650	0	0	6174
% Passenger Vehicles	93.4	0	95.7	96.9	95.7	95	93	0	0	93.9	0	0	0	0	0	0	96.3	96.4	98.3	96.4	0	0	95.4
Large 2 Axle Vehicles	6	0	14		27	28	60	0		88	0	0	0		0	0	41	13		55	0	0	170
% Large 2 Axle Vehicles	2.3	0	1.8	1.6	1.8	2.7	5	0	0	4	0	0	0	0	0	0	2.2	1.7	0.8	2	0	0	2.6
3 Axle Vehicles	4	0	0		4	2	9	0		11	0	0	0		0	0	8	0		8	0	0	23
% 3 Axle Vehicles	1.5	0	0	0	0.3	0.2	0.8	0	0	0.5	0	0	0	0	0	0	0.4	0	0	0.3	0	0	0.4
4+ Axle Trucks	7	0	20		34	22	14	0		36	0	0	0		0	0	19	15		35	0	0	105
% 4+ Axle Trucks	2.7	0	2.5	1.6	2.3	2.1	1.2	0	0	1.6	0	0	0	0	0	0	1	1.9	0.8	1.3	0	0	1.6

	I-15 Southbound Off Ramp Southbound				Limonite Avenue Westbound				I-15 Southbound On Ramp Northbound				Limonite Avenue 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 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	25	0	**134**	**159**	135	142	0	277	0	0	0	0	0	224	95	319	755
07:15 AM	25	0	92	117	**155**	132	0	287	0	0	0	0	0	253	110	363	767
07:30 AM	31	0	86	117	149	**150**	0	**299**	0	0	0	0	0	**261**	**112**	**373**	**789**
07:45 AM	**37**	0	116	153	138	144	0	282	0	0	0	0	0	223	106	329	764
Total Volume	118	0	428	546	577	568	0	1145	0	0	0	0	0	961	423	1384	3075
% App. Total	21.6	0	78.4		50.4	49.6	0		0	0	0		0	69.4	30.6		
PHF	.797	.000	.799	.858	.931	.947	.000	.957	.000	.000	.000	.000	.000	.920	.944	.928	.974

Counts Unlimited, Inc.
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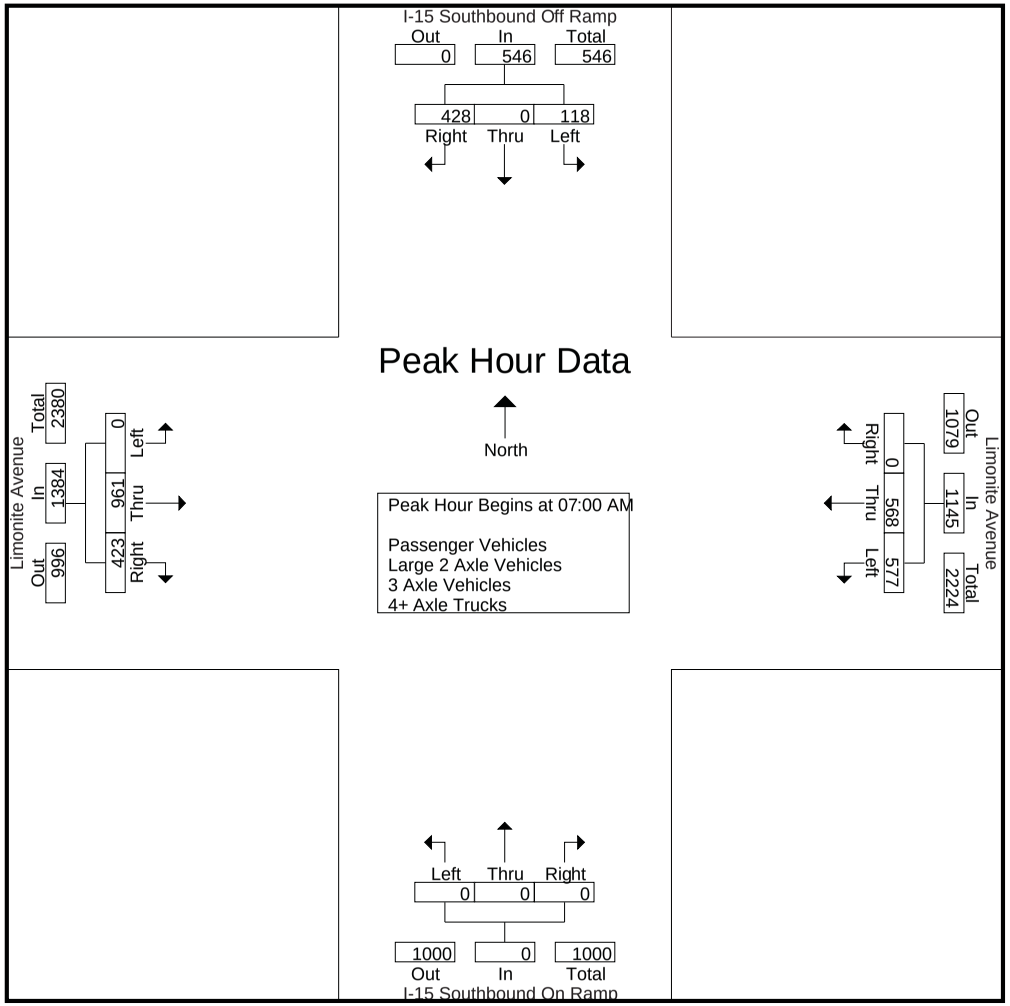
City of Eastvale
N/S: I-15 Southbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : ESV15SLIAM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



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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 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:00 AM				07:00 AM				07:00 AM				07:15 AM				
+0 mins.	25	0	**134**	**159**	135	142	0	277	0	0	0	0	0	253	110	363	
+15 mins.	25	0	92	117	**155**	132	0	287	0	0	0	0	0	**261**	**112**	**373**	
+30 mins.	31	0	86	117	149	**150**	0	**299**	0	0	0	0	0	223	106	329	
+45 mins.	**37**	0	116	153	138	144	0	282	0	0	0	0	0	240	103	343	
Total Volume	118	0	428	546	577	568	0	1145	0	0	0	0	0	977	431	1408	
% App. Total	21.6	0	78.4		50.4	49.6	0		0	0	0		0	69.4	30.6		
PHF	.797	.000	.799	.858	.931	.947	.000	.957	.000	.000	.000	.000	.000	.936	.962	.944	

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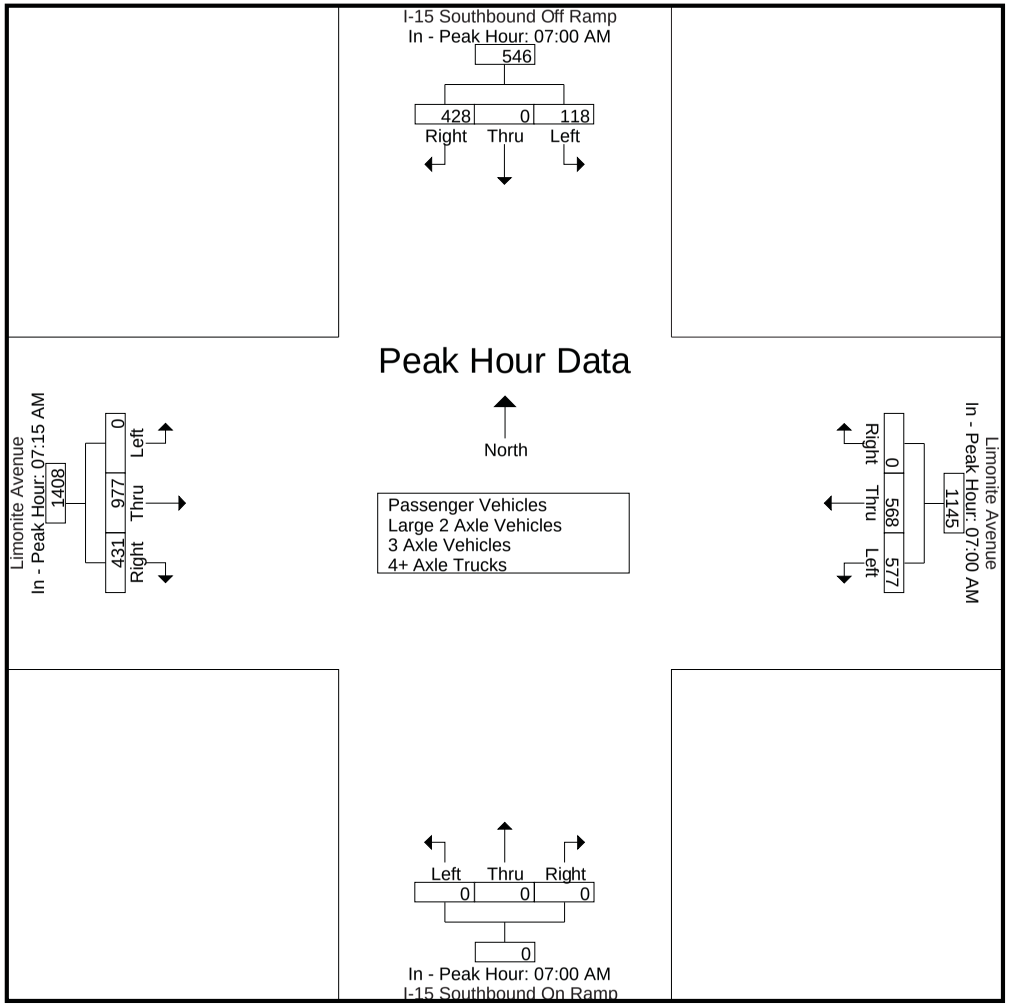

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Groups Printed- Passenger Vehicles

	I-15 Southbound Off Ramp Southbound					Limonite Avenue Westbound					I-15 Southbound On Ramp Northbound					Limonite Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	23	0	127	75	150	131	135	0	0	266	0	0	0	0	0	0	222	92	17	314	92	730	822
07:15 AM	23	0	91	56	114	152	123	0	0	275	0	0	0	0	0	0	248	106	19	354	75	743	818
07:30 AM	31	0	82	41	113	142	137	0	0	279	0	0	0	0	0	0	245	110	5	355	46	747	793
07:45 AM	34	0	110	57	144	132	130	0	0	262	0	0	0	0	0	0	210	98	10	308	67	714	781
Total	111	0	410	229	521	557	525	0	0	1082	0	0	0	0	0	0	925	406	51	1331	280	2934	3214
08:00 AM	30	0	68	44	98	110	128	0	0	238	0	0	0	0	0	0	232	100	22	332	66	668	734
08:15 AM	24	0	89	73	113	105	139	0	0	244	0	0	0	0	0	0	237	89	18	326	91	683	774
08:30 AM	44	0	82	39	126	107	160	0	0	267	0	0	0	0	0	0	229	76	10	305	49	698	747
08:45 AM	33	0	106	50	139	107	154	0	0	261	0	0	0	0	0	0	167	73	15	240	65	640	705
Total	131	0	345	206	476	429	581	0	0	1010	0	0	0	0	0	0	865	338	65	1203	271	2689	2960
Grand Total	242	0	755	435	997	986	1106	0	0	2092	0	0	0	0	0	0	1790	744	116	2534	551	5623	6174
Apprch %	24.3	0	75.7			47.1	52.9	0			0	0	0			0	70.6	29.4					
Total %	4.3	0	13.4		17.7	17.5	19.7	0		37.2	0	0	0		0	0	31.8	13.2		45.1	8.9	91.1	

	I-15 Southbound Off Ramp Southbound				Limonite Avenue Westbound				I-15 Southbound On Ramp Northbound				Limonite Avenue 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 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	23	0	**127**	**150**	131	135	0	266	0	0	0	0	0	222	92	314	730
07:15 AM	23	0	91	114	**152**	123	0	275	0	0	0	0	0	**248**	106	354	743
07:30 AM	31	0	82	113	142	**137**	0	**279**	0	0	0	0	0	245	**110**	**355**	**747**
07:45 AM	**34**	0	110	144	132	130	0	262	0	0	0	0	0	210	98	308	714
Total Volume	111	0	410	521	557	525	0	1082	0	0	0	0	0	925	406	1331	2934
% App. Total	21.3	0	78.7		51.5	48.5	0		0	0	0		0	69.5	30.5		
PHF	.816	.000	.807	.868	.916	.958	.000	.970	.000	.000	.000	.000	.000	.932	.923	.937	.982

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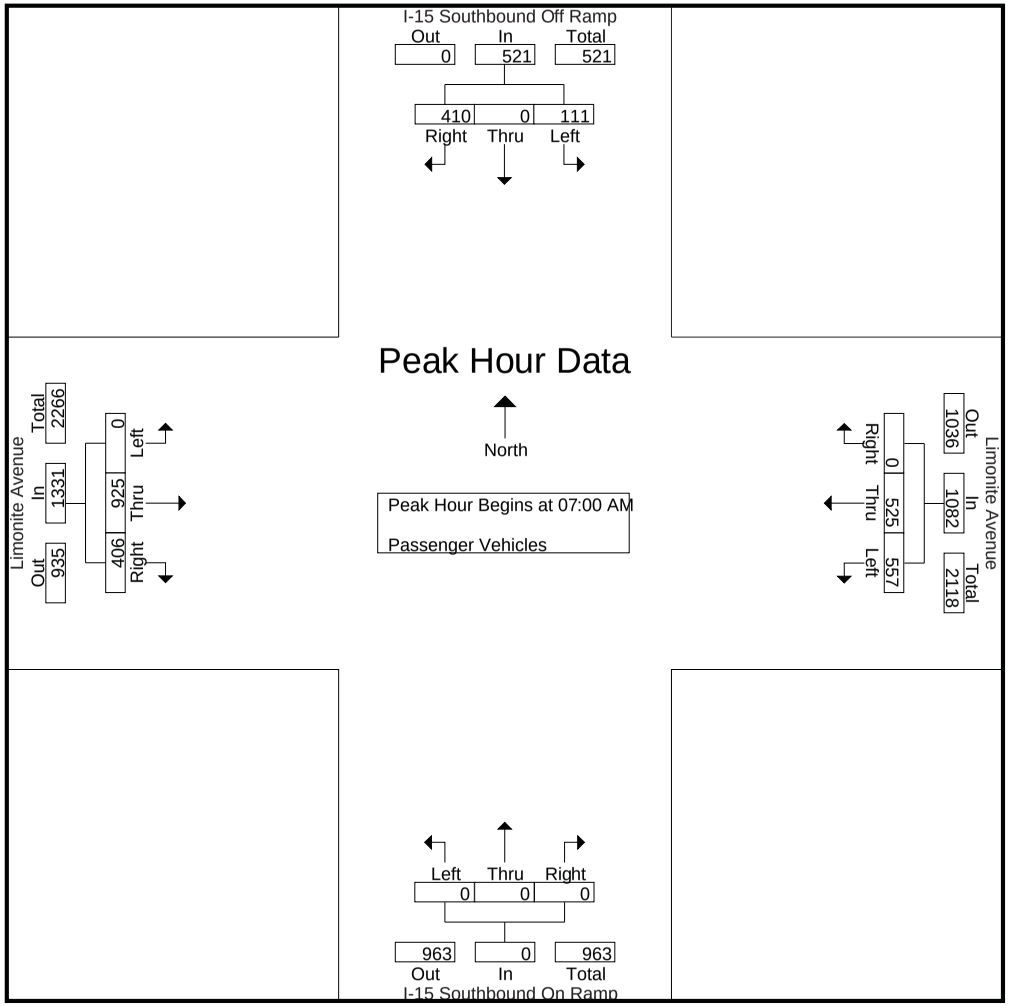

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Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:00 AM				07:00 AM				07:00 AM				07:00 AM				
+0 mins.	23	0	**127**	**150**	131	135	0	266	0	0	0	0	0	222	92	314	
+15 mins.	23	0	91	114	**152**	123	0	275	0	0	0	0	0	**248**	106	354	
+30 mins.	31	0	82	113	142	**137**	0	**279**	0	0	0	0	0	245	**110**	**355**	
+45 mins.	**34**	0	110	144	132	130	0	262	0	0	0	0	0	210	98	308	
Total Volume	111	0	410	521	557	525	0	1082	0	0	0	0	0	925	406	1331	
% App. Total	21.3	0	78.7		51.5	48.5	0		0	0	0		0	69.5	30.5		
PHF	.816	.000	.807	.868	.916	.958	.000	.970	.000	.000	.000	.000	.000	.932	.923	.937	

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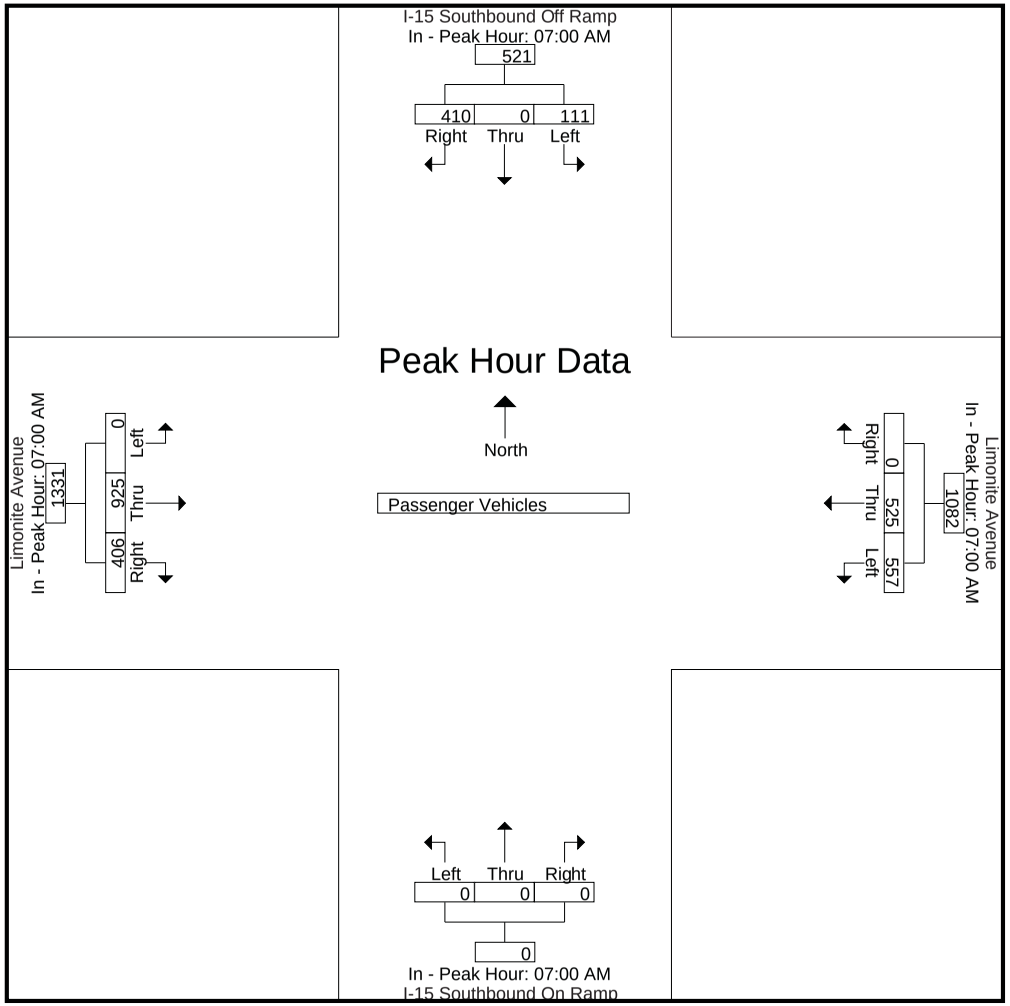

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Groups Printed- Large 2 Axle Vehicles

	I-15 Southbound Off Ramp Southbound					Limonite Avenue Westbound					I-15 Southbound On Ramp Northbound					Limonite Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	2	1	2	2	5	0	0	7	0	0	0	0	0	0	1	1	0	2	1	11	12
07:15 AM	1	0	1	0	2	3	7	0	0	10	0	0	0	0	0	0	4	3	0	7	0	19	19
07:30 AM	0	0	1	0	1	5	9	0	0	14	0	0	0	0	0	0	7	2	0	9	0	24	24
07:45 AM	1	0	2	1	3	3	8	0	0	11	0	0	0	0	0	0	6	3	1	9	2	23	25
Total	2	0	6	2	8	13	29	0	0	42	0	0	0	0	0	0	18	9	1	27	3	77	80
08:00 AM	2	0	5	4	7	2	7	0	0	9	0	0	0	0	0	0	7	1	0	8	4	24	28
08:15 AM	1	0	0	0	1	2	9	0	0	11	0	0	0	0	0	0	8	1	0	9	0	21	21
08:30 AM	1	0	0	0	1	6	7	0	0	13	0	0	0	0	0	0	4	2	0	6	0	20	20
08:45 AM	0	0	3	1	3	5	8	0	0	13	0	0	0	0	0	0	4	0	0	4	1	20	21
Total	4	0	8	5	12	15	31	0	0	46	0	0	0	0	0	0	23	4	0	27	5	85	90
Grand Total	6	0	14	7	20	28	60	0	0	88	0	0	0	0	0	0	41	13	1	54	8	162	170
Apprch %	30	0	70			31.8	68.2	0			0	0	0			0	75.9	24.1					
Total %	3.7	0	8.6		12.3	17.3	37	0		54.3	0	0	0		0	0	25.3	8		33.3	4.7	95.3	

	I-15 Southbound Off Ramp Southbound				Limonite Avenue Westbound				I-15 Southbound On Ramp Northbound				Limonite Avenue 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 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	**2**	2	2	5	0	7	0	0	0	0	0	1	1	2	11
07:15 AM	**1**	0	1	2	3	7	0	10	0	0	0	0	0	4	**3**	7	19
07:30 AM	0	0	1	1	**5**	**9**	0	**14**	0	0	0	0	0	**7**	2	**9**	**24**
07:45 AM	1	0	2	**3**	3	8	0	11	0	0	0	0	0	6	3	9	23
Total Volume	2	0	6	8	13	29	0	42	0	0	0	0	0	18	9	27	77
% App. Total	25	0	75		31	69	0		0	0	0		0	66.7	33.3		
PHF	.500	.000	.750	.667	.650	.806	.000	.750	.000	.000	.000	.000	.000	.643	.750	.750	.802

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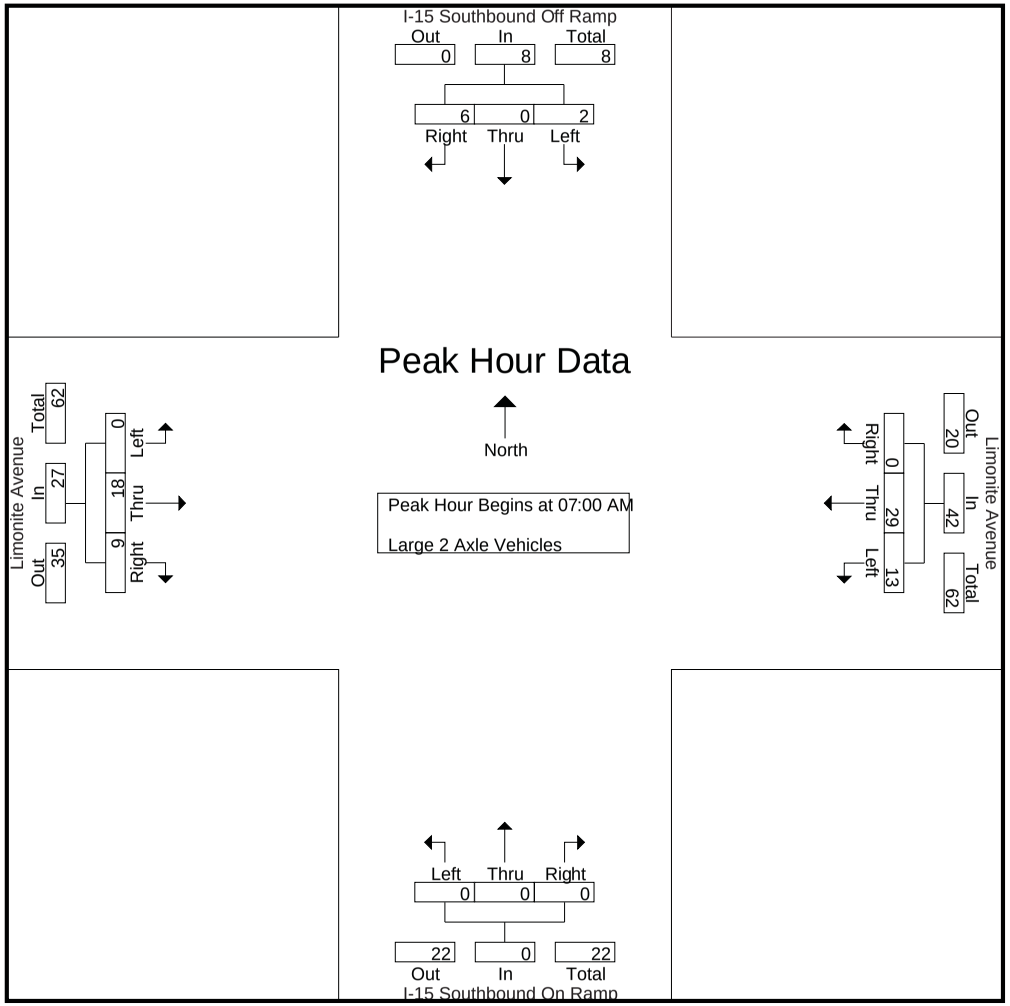

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Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:00 AM				07:00 AM				07:00 AM				07:00 AM				
+0 mins.	0	0	**2**	2	2	5	0	7	0	0	0	0	0	1	1	2	
+15 mins.	**1**	0	1	2	3	7	0	10	0	0	0	0	0	4	**3**	7	
+30 mins.	0	0	1	1	**5**	**9**	0	**14**	0	0	0	0	0	**7**	2	**9**	
+45 mins.	1	0	2	**3**	3	8	0	11	0	0	0	0	0	6	3	9	
Total Volume	2	0	6	8	13	29	0	42	0	0	0	0	0	18	9	27	
% App. Total	25	0	75		31	69	0		0	0	0		0	66.7	33.3		
PHF	.500	.000	.750	.667	.650	.806	.000	.750	.000	.000	.000	.000	.000	.643	.750	.750	

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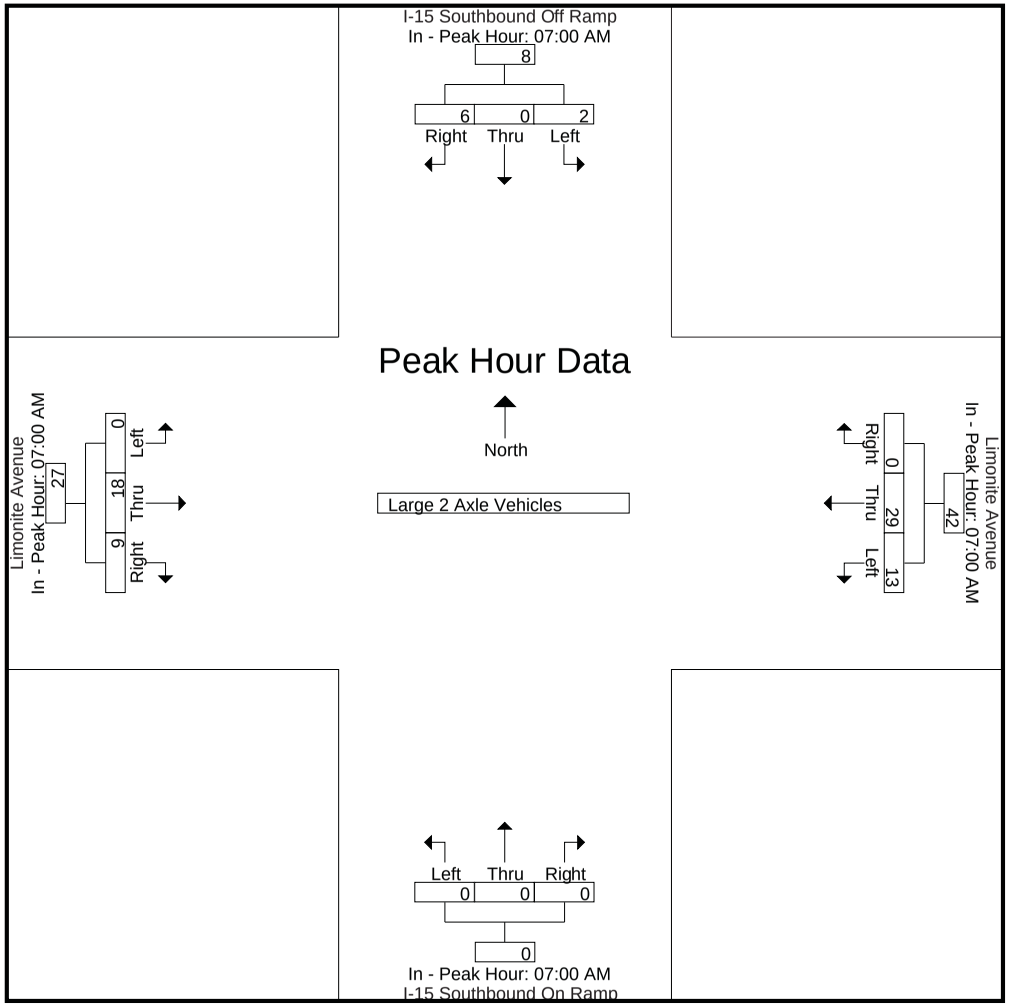

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Groups Printed- 3 Axle Vehicles

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Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	1
07:15 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	2	2
07:30 AM	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	0	2	0	0	2	0	5	5
07:45 AM	1	0	0	0	1	0	4	0	0	4	0	0	0	0	0	0	1	0	0	1	0	6	6
Total	2	0	0	0	2	1	6	0	0	7	0	0	0	0	0	0	5	0	0	5	0	14	14
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	3	3
08:30 AM	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	0	1	0	0	1	0	4	4
08:45 AM	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	2
Total	2	0	0	0	2	1	3	0	0	4	0	0	0	0	0	0	3	0	0	3	0	9	9
Grand Total	4	0	0	0	4	2	9	0	0	11	0	0	0	0	0	0	8	0	0	8	0	23	23
Apprch %	100	0	0			18.2	81.8	0			0	0	0			0	100	0					
Total %	17.4	0	0		17.4	8.7	39.1	0		47.8	0	0	0		0	0	34.8	0		34.8	0	100	

	I-15 Southbound Off Ramp Southbound				Limonite Avenue Westbound				I-15 Southbound On Ramp Northbound				Limonite Avenue 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 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
07:15 AM	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	1	0	1	2
07:30 AM	0	0	0	0	**1**	2	0	3	0	0	0	0	0	**2**	0	**2**	5
07:45 AM	1	0	0	1	0	**4**	0	**4**	0	0	0	0	0	1	0	1	**6**
Total Volume	2	0	0	2	1	6	0	7	0	0	0	0	0	5	0	5	14
% App. Total	100	0	0		14.3	85.7	0		0	0	0		0	100	0		
PHF	.500	.000	.000	.500	.250	.375	.000	.438	.000	.000	.000	.000	.000	.625	.000	.625	.583

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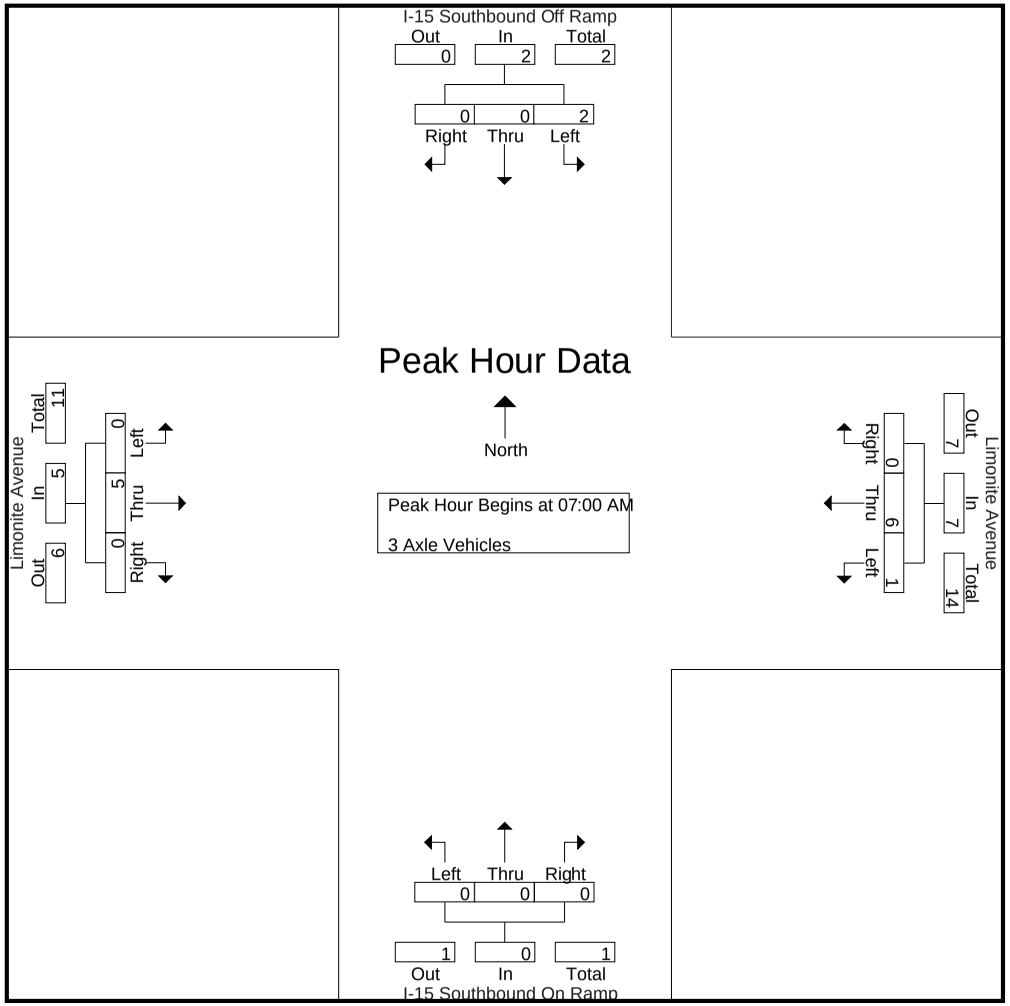
City of Eastvale
N/S: I-15 Southbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : ESV15SLIAM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



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City of Eastvale
N/S: I-15 Southbound Ramps
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File Name : ESV15SLIAM
Site Code : 05114187
Start Date : 5/1/2014

	I-15 Southbound Off Ramp Southbound				Limonite Avenue Westbound				I-15 Southbound On Ramp Northbound				Limonite Avenue 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 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:00 AM				07:00 AM				07:00 AM				07:00 AM				
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	
+15 mins.	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	1	0	1	
+30 mins.	0	0	0	0	**1**	2	0	3	0	0	0	0	0	**2**	0	**2**	
+45 mins.	1	0	0	1	0	**4**	0	**4**	0	0	0	0	0	1	0	1	
Total Volume	2	0	0	2	1	6	0	7	0	0	0	0	0	5	0	5	
% App. Total	100	0	0		14.3	85.7	0		0	0	0		0	100	0		
PHF	.500	.000	.000	.500	.250	.375	.000	.438	.000	.000	.000	.000	.000	.625	.000	.625	

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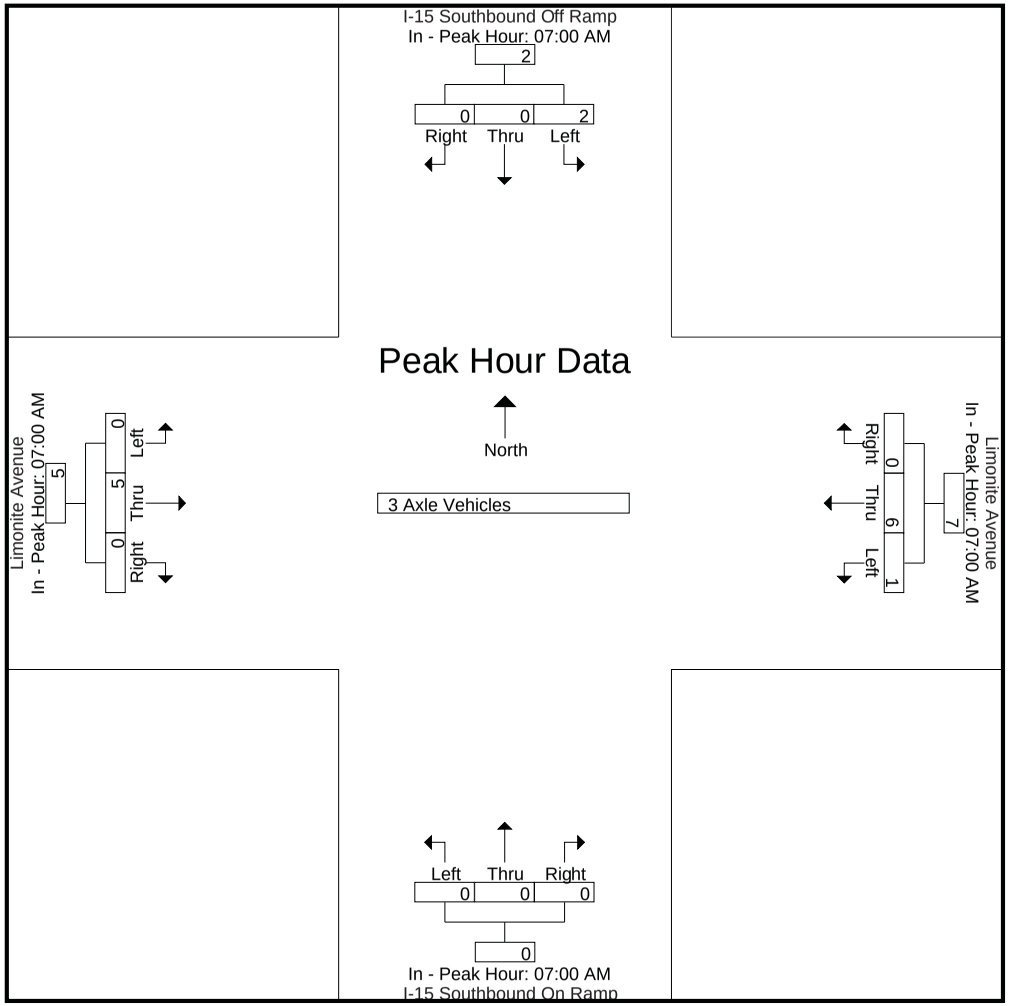

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City of Eastvale
N/S: I-15 Southbound Ramps
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File Name : ESV15SLIAM
Site Code : 05114187
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Groups Printed- 4+ Axle Trucks

	I-15 Southbound Off Ramp Southbound					Limonite Avenue Westbound					I-15 Southbound On Ramp Northbound					Limonite Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	2	0	5	1	7	2	2	0	0	4	0	0	0	0	0	0	0	2	0	2	1	13	14
07:15 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	1	0	1	0	3	3
07:30 AM	0	0	3	1	3	1	2	0	0	3	0	0	0	0	0	0	7	0	0	7	1	13	14
07:45 AM	1	0	4	1	5	3	2	0	0	5	0	0	0	0	0	0	6	5	0	11	1	21	22
Total	3	0	12	3	15	6	8	0	0	14	0	0	0	0	0	0	13	8	0	21	3	50	53
08:00 AM	1	0	3	2	4	1	2	0	0	3	0	0	0	0	0	0	1	2	0	3	2	10	12
08:15 AM	2	0	2	2	4	4	3	0	0	7	0	0	0	0	0	0	3	1	0	4	2	15	17
08:30 AM	0	0	0	0	0	4	1	0	0	5	0	0	0	0	0	0	0	1	1	1	1	6	7
08:45 AM	1	0	3	0	4	7	0	0	0	7	0	0	0	0	0	0	2	3	0	5	0	16	16
Total	4	0	8	4	12	16	6	0	0	22	0	0	0	0	0	0	6	7	1	13	5	47	52
Grand Total	7	0	20	7	27	22	14	0	0	36	0	0	0	0	0	0	19	15	1	34	8	97	105
Apprch %	25.9	0	74.1			61.1	38.9	0			0	0	0			0	55.9	44.1					
Total %	7.2	0	20.6		27.8	22.7	14.4	0		37.1	0	0	0		0	0	19.6	15.5		35.1	7.6	92.4	

	I-15 Southbound Off Ramp Southbound				Limonite Avenue Westbound				I-15 Southbound On Ramp Northbound				Limonite Avenue 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 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**2**	0	**5**	**7**	2	**2**	0	4	0	0	0	0	0	0	2	2	13
07:15 AM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	1	1	3
07:30 AM	0	0	3	3	1	2	0	3	0	0	0	0	0	**7**	0	7	13
07:45 AM	1	0	4	5	**3**	2	0	**5**	0	0	0	0	0	6	**5**	**11**	**21**
Total Volume	3	0	12	15	6	8	0	14	0	0	0	0	0	13	8	21	50
% App. Total	20	0	80		42.9	57.1	0		0	0	0		0	61.9	38.1		
PHF	.375	.000	.600	.536	.500	1.00	.000	.700	.000	.000	.000	.000	.000	.464	.400	.477	.595

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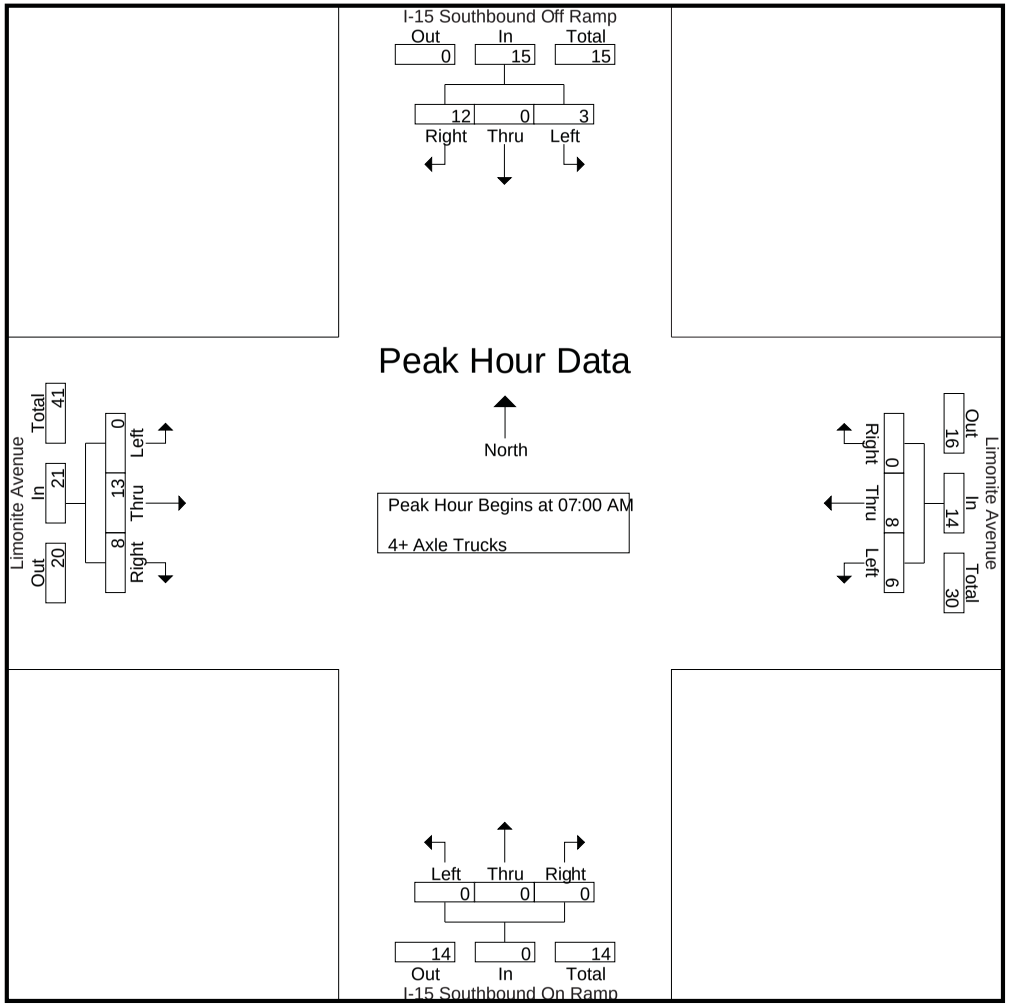
City of Eastvale
N/S: I-15 Southbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : ESV15SLIAM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



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	I-15 Southbound Off Ramp Southbound				Limonite Avenue Westbound				I-15 Southbound On Ramp Northbound				Limonite Avenue 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 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:00 AM				07:00 AM				07:00 AM				07:00 AM				
+0 mins.	**2**	0	**5**	**7**	2	**2**	0	4	0	0	0	0	0	0	2	2	
+15 mins.	0	0	0	0	0	2	0	2	0	0	0	0	0	0	1	1	
+30 mins.	0	0	3	3	1	2	0	3	0	0	0	0	0	**7**	0	7	
+45 mins.	1	0	4	5	**3**	2	0	**5**	0	0	0	0	0	6	**5**	**11**	
Total Volume	3	0	12	15	6	8	0	14	0	0	0	0	0	13	8	21	
% App. Total	20	0	80		42.9	57.1	0		0	0	0		0	61.9	38.1		
PHF	.375	.000	.600	.536	.500	1.000	.000	.700	.000	.000	.000	.000	.000	.464	.400	.477	

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File Name : ESV15SLIAM
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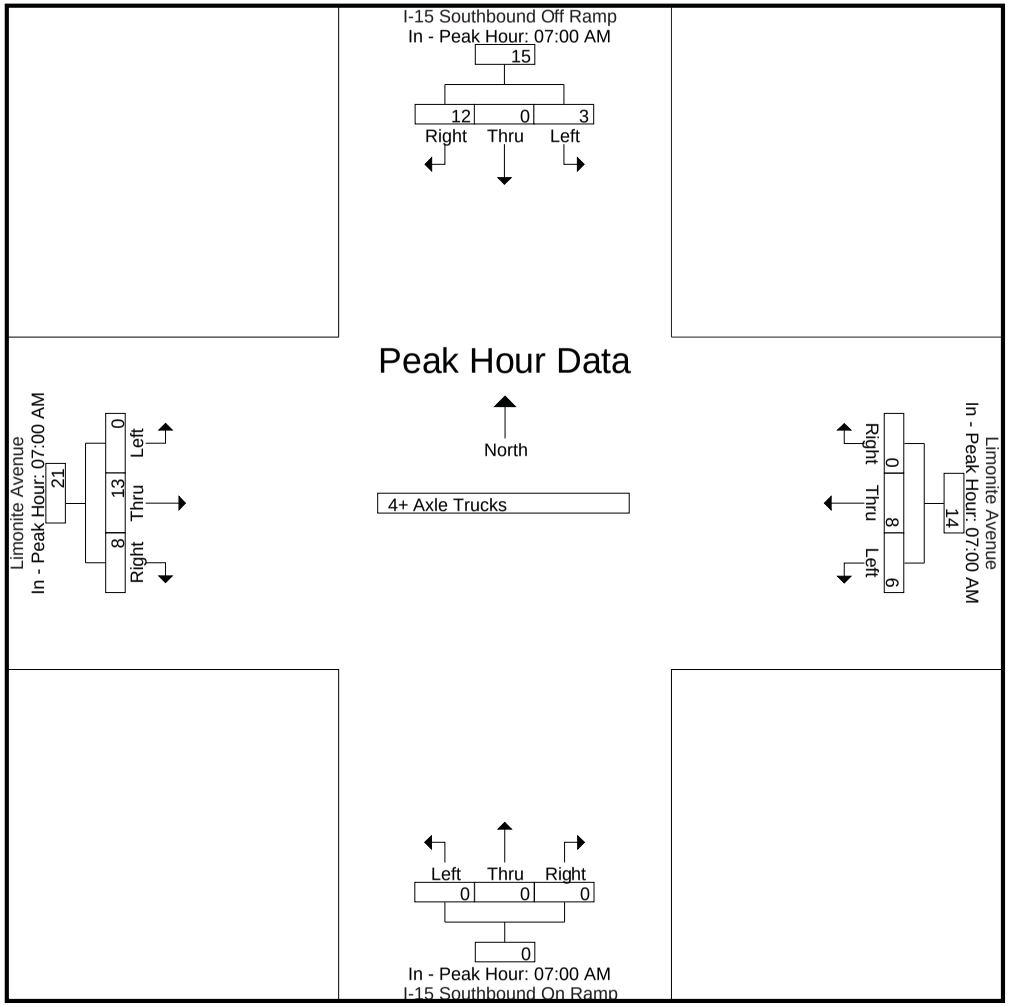

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City of Eastvale
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File Name : ESV15SLIPM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	I-15 Southbound Off Ramp Southbound					Limonite Avenue Westbound					I-15 Southbound On Ramp Northbound					Limonite Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	31	0	111	65	142	83	211	0	0	294	0	0	0	0	0	0	286	105	21	391	86	827	913
04:15 PM	39	0	125	65	164	107	180	0	0	287	0	0	0	0	0	0	303	133	30	436	95	887	982
04:30 PM	49	0	123	92	172	73	185	0	0	258	0	0	0	0	0	0	251	113	51	364	143	794	937
04:45 PM	56	0	127	71	183	89	228	0	0	317	0	0	0	0	0	0	265	110	32	375	103	875	978
Total	175	0	486	293	661	352	804	0	0	1156	0	0	0	0	0	0	1105	461	134	1566	427	3383	3810
05:00 PM	60	0	147	60	207	110	208	0	0	318	0	0	0	0	0	0	285	122	37	407	97	932	1029
05:15 PM	42	1	129	69	172	101	209	0	0	310	0	0	0	0	0	0	282	103	45	385	114	867	981
05:30 PM	58	0	136	59	194	115	212	0	0	327	0	0	0	0	0	0	241	106	36	347	95	868	963
05:45 PM	46	1	140	66	187	92	216	0	0	308	0	0	0	0	0	0	248	86	28	334	94	829	923
Total	206	2	552	254	760	418	845	0	0	1263	0	0	0	0	0	0	1056	417	146	1473	400	3496	3896
Grand Total	381	2	1038	547	1421	770	1649	0	0	2419	0	0	0	0	0	0	2161	878	280	3039	827	6879	7706
Apprch %	26.8	0.1	73			31.8	68.2	0			0	0	0			0	71.1	28.9					
Total %	5.5	0	15.1		20.7	11.2	24	0		35.2	0	0	0		0	0	31.4	12.8		44.2	10.7	89.3	
Passenger Vehicles	370	2	1015		1925	754	1623	0		2377	0	0	0		0	0	2123	856		3254	0	0	7556
% Passenger Vehicles	97.1	100	97.8	98.4	97.8	97.9	98.4	0	0	98.3	0	0	0	0	0	0	98.2	97.5	98.2	98	0	0	98.1
Large 2 Axle Vehicles	4	0	10		19	4	18	0		22	0	0	0		0	0	27	13		43	0	0	84
% Large 2 Axle Vehicles	1	0	1	0.9	1	0.5	1.1	0	0	0.9	0	0	0	0	0	0	1.2	1.5	1.1	1.3	0	0	1.1
3 Axle Vehicles	1	0	4		7	4	3	0		7	0	0	0		0	0	3	3		6	0	0	20
% 3 Axle Vehicles	0.3	0	0.4	0.4	0.4	0.5	0.2	0	0	0.3	0	0	0	0	0	0	0.1	0.3	0	0.2	0	0	0.3
4+ Axle Trucks	6	0	9		17	8	5	0		13	0	0	0		0	0	8	6		16	0	0	46
% 4+ Axle Trucks	1.6	0	0.9	0.4	0.9	1	0.3	0	0	0.5	0	0	0	0	0	0	0.4	0.7	0.7	0.5	0	0	0.6

	I-15 Southbound Off Ramp Southbound				Limonite Avenue Westbound				I-15 Southbound On Ramp Northbound				Limonite Avenue 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	56	0	127	183	89	**228**	0	317	0	0	0	0	0	265	110	375	875
05:00 PM	**60**	0	**147**	**207**	110	208	0	318	0	0	0	0	0	**285**	**122**	**407**	**932**
05:15 PM	42	**1**	129	172	101	209	0	310	0	0	0	0	0	282	103	385	867
05:30 PM	58	0	136	194	**115**	212	0	**327**	0	0	0	0	0	241	106	347	868
Total Volume	216	1	539	756	415	857	0	1272	0	0	0	0	0	1073	441	1514	3542
% App. Total	28.6	0.1	71.3		32.6	67.4	0		0	0	0		0	70.9	29.1		
PHF	.900	.250	.917	.913	.902	.940	.000	.972	.000	.000	.000	.000	.000	.941	.904	.930	.950

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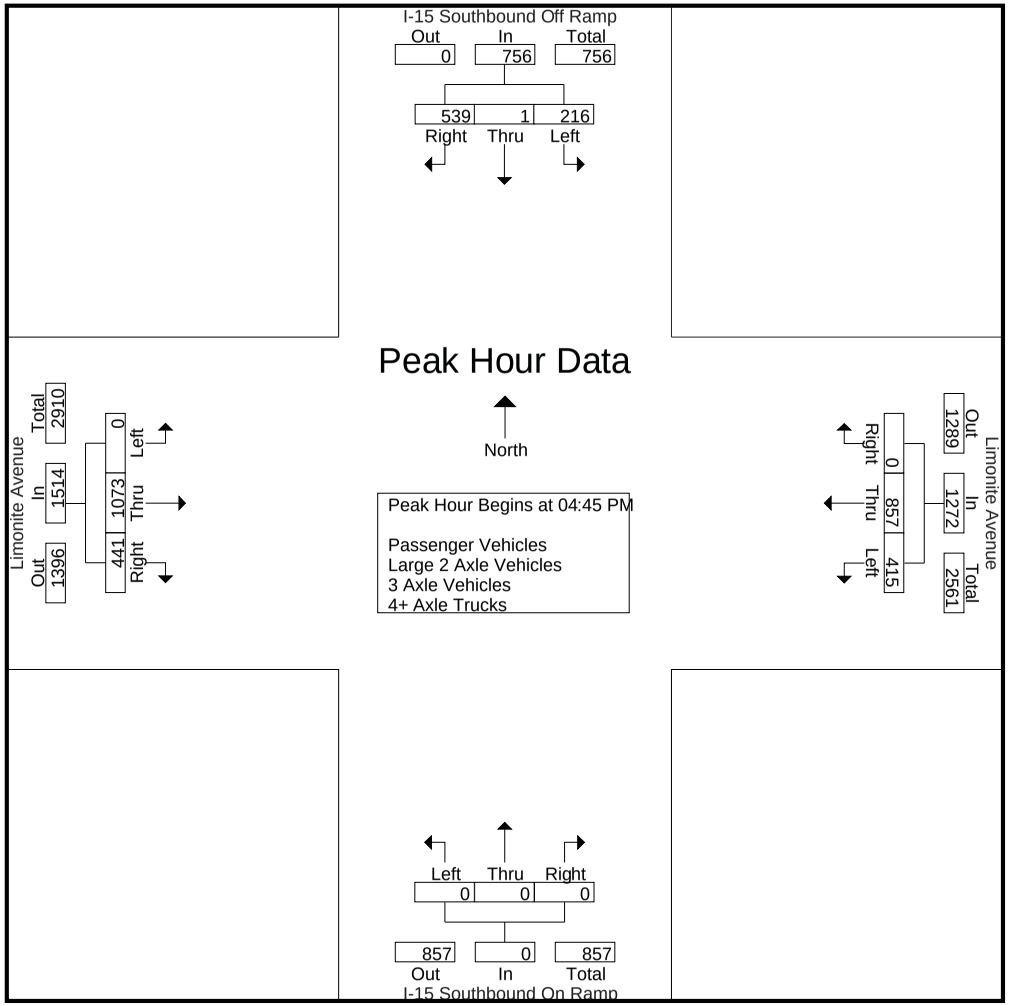

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	I-15 Southbound Off Ramp Southbound				Limonite Avenue Westbound				I-15 Southbound On Ramp Northbound				Limonite Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	05:00 PM				04:45 PM				04:00 PM				04:15 PM				
+0 mins.	**60**	0	**147**	**207**	89	**228**	0	317	0	0	0	0	0	**303**	**133**	**436**	
+15 mins.	42	**1**	129	172	110	208	0	318	0	0	0	0	0	251	113	364	
+30 mins.	58	0	136	194	101	209	0	310	0	0	0	0	0	265	110	375	
+45 mins.	46	1	140	187	**115**	212	0	**327**	0	0	0	0	0	285	122	407	
Total Volume	206	2	552	760	415	857	0	1272	0	0	0	0	0	1104	478	1582	
% App. Total	27.1	0.3	72.6		32.6	67.4	0		0	0	0		0	69.8	30.2		
PHF	.858	.500	.939	.918	.902	.940	.000	.972	.000	.000	.000	.000	.000	.911	.898	.907	

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Groups Printed- Passenger Vehicles

	I-15 Southbound Off Ramp Southbound					Limonite Avenue Westbound					I-15 Southbound On Ramp Northbound					Limonite Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	31	0	111	65	142	80	207	0	0	287	0	0	0	0	0	0	279	101	20	380	85	809	894
04:15 PM	38	0	120	63	158	103	178	0	0	281	0	0	0	0	0	0	301	131	29	432	92	871	963
04:30 PM	48	0	122	91	170	72	182	0	0	254	0	0	0	0	0	0	247	109	50	356	141	780	921
04:45 PM	53	0	126	70	179	87	223	0	0	310	0	0	0	0	0	0	259	108	32	367	102	856	958
Total	170	0	479	289	649	342	790	0	0	1132	0	0	0	0	0	0	1086	449	131	1535	420	3316	3736
05:00 PM	58	0	143	59	201	107	205	0	0	312	0	0	0	0	0	0	278	119	36	397	95	910	1005
05:15 PM	42	1	127	69	170	100	206	0	0	306	0	0	0	0	0	0	275	101	44	376	113	852	965
05:30 PM	58	0	131	57	189	115	209	0	0	324	0	0	0	0	0	0	238	105	36	343	93	856	949
05:45 PM	42	1	135	64	178	90	213	0	0	303	0	0	0	0	0	0	246	82	28	328	92	809	901
Total	200	2	536	249	738	412	833	0	0	1245	0	0	0	0	0	0	1037	407	144	1444	393	3427	3820
Grand Total	370	2	1015	538	1387	754	1623	0	0	2377	0	0	0	0	0	0	2123	856	275	2979	813	6743	7556
Apprch %	26.7	0.1	73.2			31.7	68.3	0			0	0	0			0	71.3	28.7					
Total %	5.5	0	15.1		20.6	11.2	24.1	0		35.3	0	0	0		0	0	31.5	12.7		44.2	10.8	89.2	

	I-15 Southbound Off Ramp Southbound				Limonite Avenue Westbound				I-15 Southbound On Ramp Northbound				Limonite Avenue 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 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	53	0	126	179	87	**223**	0	310	0	0	0	0	0	259	108	367	856
05:00 PM	**58**	0	**143**	**201**	107	205	0	312	0	0	0	0	0	**278**	**119**	**397**	**910**
05:15 PM	42	**1**	127	170	100	206	0	306	0	0	0	0	0	275	101	376	852
05:30 PM	58	0	131	189	**115**	209	0	**324**	0	0	0	0	0	238	105	343	856
Total Volume	211	1	527	739	409	843	0	1252	0	0	0	0	0	1050	433	1483	3474
% App. Total	28.6	0.1	71.3		32.7	67.3	0		0	0	0		0	70.8	29.2		
PHF	.909	.250	.921	.919	.889	.945	.000	.966	.000	.000	.000	.000	.000	.944	.910	.934	.954

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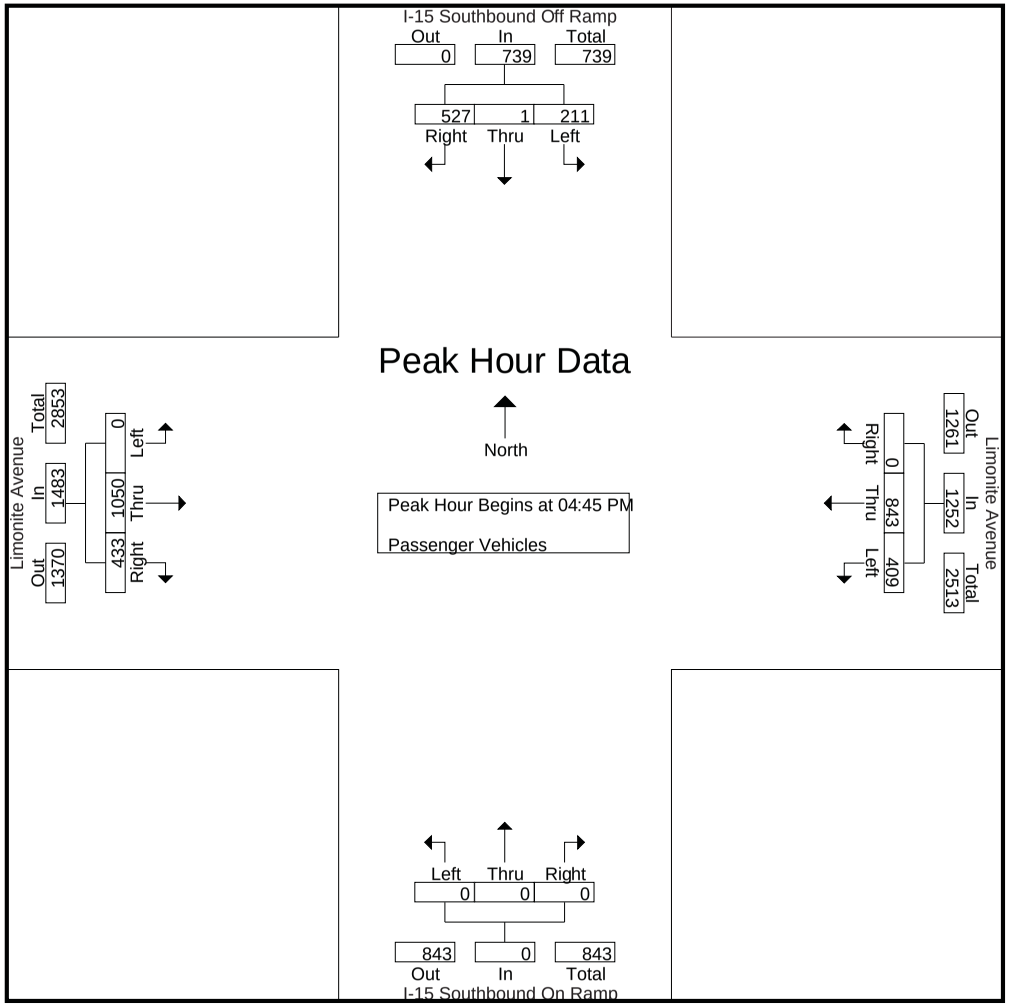
City of Eastvale
N/S: I-15 Southbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : ESV15SLIPM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



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City of Eastvale
N/S: I-15 Southbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : ESV15SLIPM
Site Code : 05114187
Start Date : 5/1/2014

	I-15 Southbound Off Ramp Southbound				Limonite Avenue Westbound				I-15 Southbound On Ramp Northbound				Limonite Avenue 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 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	04:45 PM				04:45 PM				04:45 PM				04:45 PM				
+0 mins.	53	0	126	179	87	**223**	0	310	0	0	0	0	0	259	108	367	
+15 mins.	**58**	0	**143**	**201**	107	205	0	312	0	0	0	0	0	**278**	**119**	**397**	
+30 mins.	42	**1**	127	170	100	206	0	306	0	0	0	0	0	275	101	376	
+45 mins.	58	0	131	189	**115**	209	0	**324**	0	0	0	0	0	238	105	343	
Total Volume	211	1	527	739	409	843	0	1252	0	0	0	0	0	1050	433	1483	
% App. Total	28.6	0.1	71.3		32.7	67.3	0		0	0	0		0	70.8	29.2		
PHF	.909	.250	.921	.919	.889	.945	.000	.966	.000	.000	.000	.000	.000	.944	.910	.934	

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City of Eastvale
N/S: I-15 Southbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : ESV15SLIPM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- Large 2 Axle Vehicles

	I-15 Southbound Off Ramp Southbound					Limonite Avenue Westbound					I-15 Southbound On Ramp Northbound					Limonite Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	3	4	0	0	7	0	0	0	0	0	0	5	3	1	8	1	15	16
04:15 PM	0	0	2	1	2	0	2	0	0	2	0	0	0	0	0	0	1	1	0	2	1	6	7
04:30 PM	0	0	1	1	1	0	2	0	0	2	0	0	0	0	0	0	3	3	1	6	2	9	11
04:45 PM	1	0	1	1	2	0	3	0	0	3	0	0	0	0	0	0	5	1	0	6	1	11	12
Total	1	0	4	3	5	3	11	0	0	14	0	0	0	0	0	0	14	8	2	22	5	41	46
05:00 PM	1	0	2	1	3	1	2	0	0	3	0	0	0	0	0	0	5	1	1	6	2	12	14
05:15 PM	0	0	1	0	1	0	2	0	0	2	0	0	0	0	0	0	5	0	0	5	0	8	8
05:30 PM	0	0	2	0	2	0	1	0	0	1	0	0	0	0	0	0	2	1	0	3	0	6	6
05:45 PM	2	0	1	1	3	0	2	0	0	2	0	0	0	0	0	0	1	3	0	4	1	9	10
Total	3	0	6	2	9	1	7	0	0	8	0	0	0	0	0	0	13	5	1	18	3	35	38
Grand Total	4	0	10	5	14	4	18	0	0	22	0	0	0	0	0	0	27	13	3	40	8	76	84
Apprch %	28.6	0	71.4			18.2	81.8	0			0	0	0			0	67.5	32.5					
Total %	5.3	0	13.2		18.4	5.3	23.7	0		28.9	0	0	0		0	0	35.5	17.1		52.6	9.5	90.5	

	I-15 Southbound Off Ramp Southbound				Limonite Avenue Westbound				I-15 Southbound On Ramp Northbound				Limonite Avenue 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 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**1**	0	1	2	0	**3**	0	**3**	0	0	0	0	0	**5**	**1**	**6**	11
05:00 PM	1	0	**2**	**3**	**1**	2	0	3	0	0	0	0	0	5	1	6	**12**
05:15 PM	0	0	1	1	0	2	0	2	0	0	0	0	0	5	0	5	8
05:30 PM	0	0	2	2	0	1	0	1	0	0	0	0	0	2	1	3	6
Total Volume	2	0	6	8	1	8	0	9	0	0	0	0	0	17	3	20	37
% App. Total	25	0	75		11.1	88.9	0		0	0	0		0	85	15		
PHF	.500	.000	.750	.667	.250	.667	.000	.750	.000	.000	.000	.000	.000	.850	.750	.833	.771

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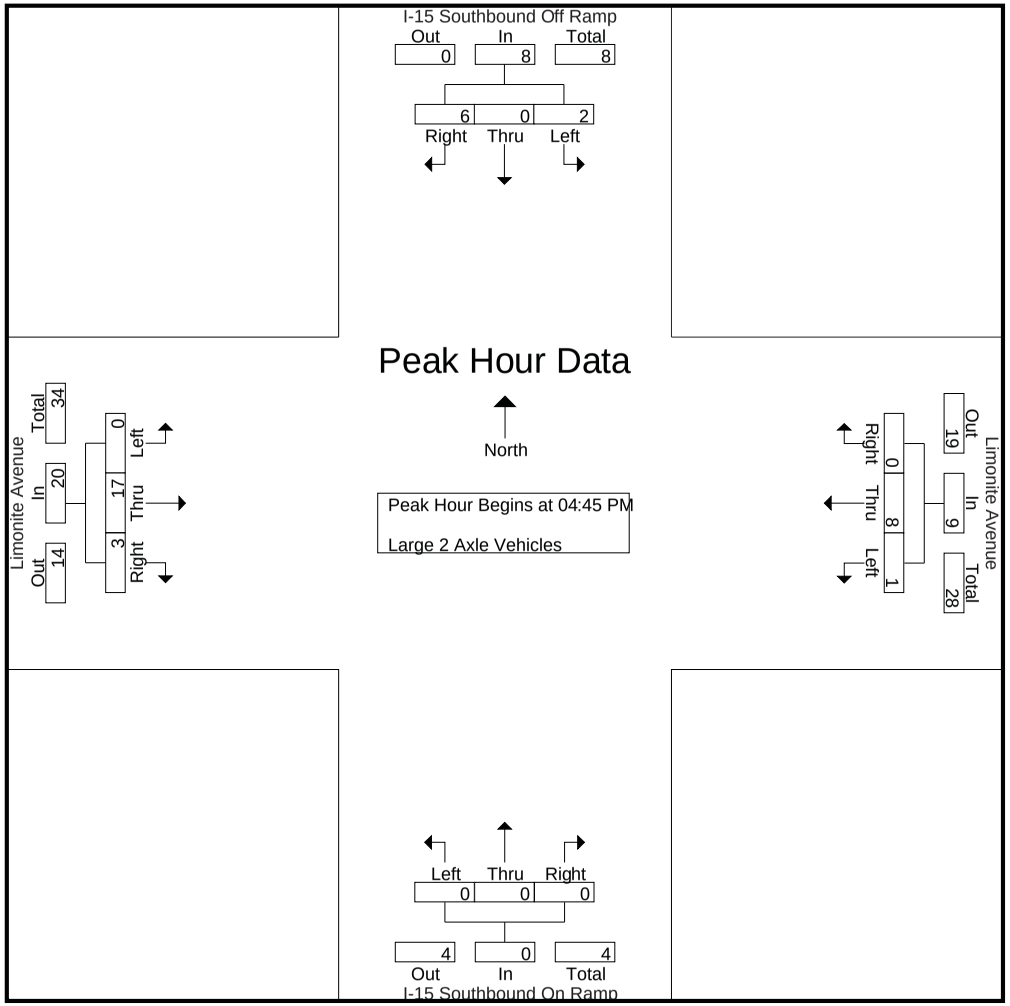
City of Eastvale
N/S: I-15 Southbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : ESV15SLIPM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



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City of Eastvale
N/S: I-15 Southbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : ESV15SLIPM
Site Code : 05114187
Start Date : 5/1/2014

	I-15 Southbound Off Ramp Southbound				Limonite Avenue Westbound				I-15 Southbound On Ramp Northbound				Limonite Avenue 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 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	04:45 PM				04:45 PM				04:45 PM				04:45 PM				
+0 mins.	**1**	0	1	2	0	**3**	0	**3**	0	0	0	0	0	**5**	**1**	**6**	
+15 mins.	1	0	**2**	**3**	**1**	2	0	3	0	0	0	0	0	5	1	6	
+30 mins.	0	0	1	1	0	2	0	2	0	0	0	0	0	5	0	5	
+45 mins.	0	0	2	2	0	1	0	1	0	0	0	0	0	2	1	3	
Total Volume	2	0	6	8	1	8	0	9	0	0	0	0	0	17	3	20	
% App. Total	25	0	75		11.1	88.9	0		0	0	0		0	85	15		
PHF	.500	.000	.750	.667	.250	.667	.000	.750	.000	.000	.000	.000	.000	.850	.750	.833	

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City of Eastvale
N/S: I-15 Southbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : ESV15SLIPM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- 3 Axle Vehicles

	I-15 Southbound Off Ramp Southbound					Limonite Avenue Westbound					I-15 Southbound On Ramp Northbound					Limonite Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	2	2
04:15 PM	0	0	1	0	1	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	3	3
04:30 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	0	1	2	1	0	0	3	0	0	0	0	0	0	1	1	0	2	0	6	6
05:00 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0	3	3
05:15 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	2	2
05:30 PM	0	0	1	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	2	3
05:45 PM	0	0	2	1	2	1	1	0	0	2	0	0	0	0	0	0	0	1	0	1	1	5	6
Total	1	0	3	2	4	2	2	0	0	4	0	0	0	0	0	0	2	2	0	4	2	12	14
Grand Total	1	0	4	2	5	4	3	0	0	7	0	0	0	0	0	0	3	3	0	6	2	18	20
Apprch %	20	0	80			57.1	42.9	0			0	0	0			0	50	50					
Total %	5.6	0	22.2		27.8	22.2	16.7	0		38.9	0	0	0		0	0	16.7	16.7		33.3	10	90	

	I-15 Southbound Off Ramp Southbound				Limonite Avenue Westbound				I-15 Southbound On Ramp Northbound				Limonite Avenue 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 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	**1**	**1**	**2**	**3**
05:15 PM	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	1	0	1	2
05:30 PM	0	0	**1**	1	0	**1**	0	1	0	0	0	0	0	0	0	0	2
Total Volume	1	0	1	2	1	1	0	2	0	0	0	0	0	2	1	3	7
% App. Total	50	0	50		50	50	0		0	0	0		0	66.7	33.3		
PHF	.250	.000	.250	.500	.250	.250	.000	.500	.000	.000	.000	.000	.000	.500	.250	.375	.583

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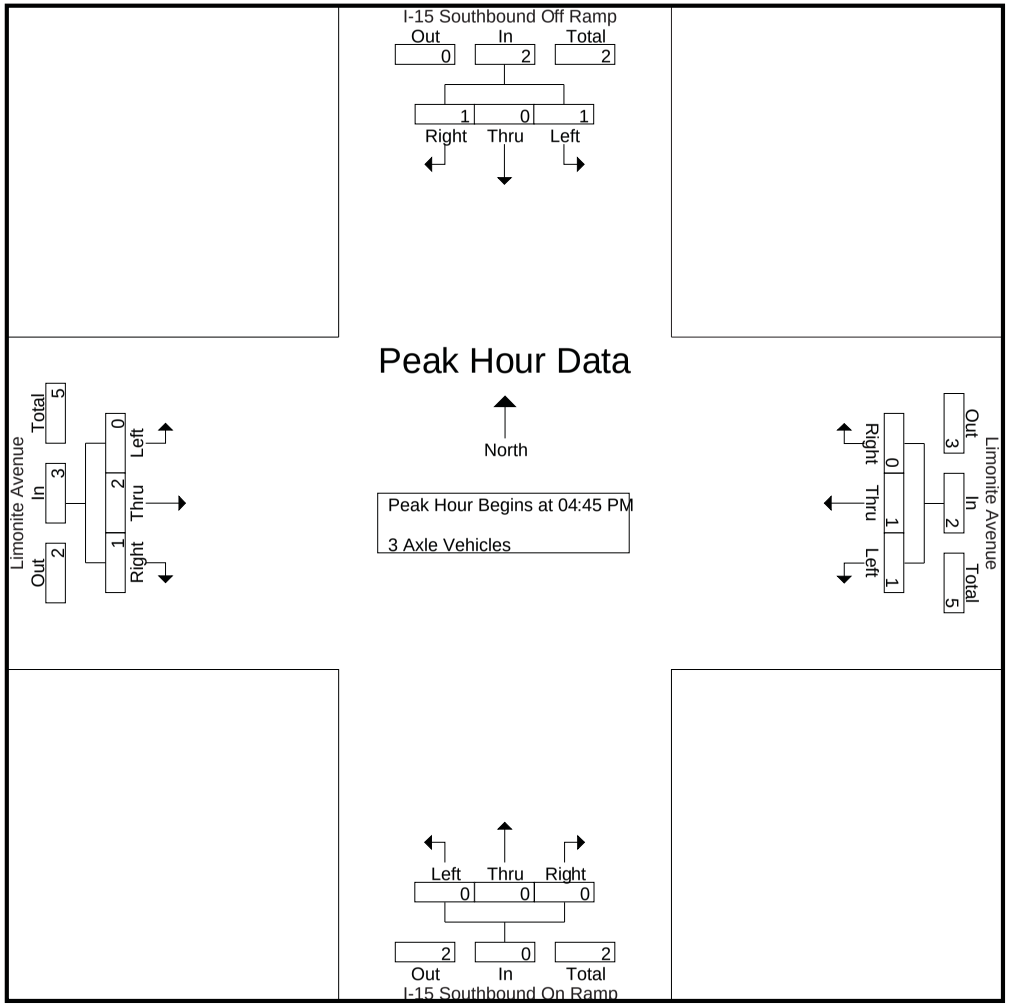
City of Eastvale
N/S: I-15 Southbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : ESV15SLIPM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



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City of Eastvale
N/S: I-15 Southbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : ESV15SLIPM
Site Code : 05114187
Start Date : 5/1/2014

	I-15 Southbound Off Ramp Southbound				Limonite Avenue Westbound				I-15 Southbound On Ramp Northbound				Limonite Avenue 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 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	04:45 PM				04:45 PM				04:45 PM				04:45 PM				
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
+15 mins.	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	**1**	**1**	**2**	
+30 mins.	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	1	0	1	
+45 mins.	0	0	**1**	1	0	**1**	0	1	0	0	0	0	0	0	0	0	
Total Volume	1	0	1	2	1	1	0	2	0	0	0	0	0	2	1	3	
% App. Total	50	0	50		50	50	0		0	0	0		0	66.7	33.3		
PHF	.250	.000	.250	.500	.250	.250	.000	.500	.000	.000	.000	.000	.000	.500	.250	.375	

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City of Eastvale
N/S: I-15 Southbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : ESV15SLIPM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- 4+ Axle Trucks

	I-15 Southbound Off Ramp Southbound					Limonite Avenue Westbound					I-15 Southbound On Ramp Northbound					Limonite Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	1
04:15 PM	1	0	2	1	3	2	0	0	0	2	0	0	0	0	0	0	1	1	1	2	2	7	9
04:30 PM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	1	1	0	2	0	4	4
04:45 PM	2	0	0	0	2	2	2	0	0	4	0	0	0	0	0	0	1	1	0	2	0	8	8
Total	4	0	2	1	6	5	2	0	0	7	0	0	0	0	0	0	4	3	1	7	2	20	22
05:00 PM	0	0	2	0	2	2	1	0	0	3	0	0	0	0	0	0	1	1	0	2	0	7	7
05:15 PM	0	0	1	0	1	0	1	0	0	1	0	0	0	0	0	0	1	2	1	3	1	5	6
05:30 PM	0	0	2	1	2	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	1	4	5
05:45 PM	2	0	2	0	4	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	6	6
Total	2	0	7	1	9	3	3	0	0	6	0	0	0	0	0	0	4	3	1	7	2	22	24
Grand Total	6	0	9	2	15	8	5	0	0	13	0	0	0	0	0	0	8	6	2	14	4	42	46
Apprch %	40	0	60			61.5	38.5	0			0	0	0			0	57.1	42.9					
Total %	14.3	0	21.4		35.7	19	11.9	0		31	0	0	0		0	0	19	14.3		33.3	8.7	91.3	

	I-15 Southbound Off Ramp Southbound				Limonite Avenue Westbound				I-15 Southbound On Ramp Northbound				Limonite Avenue 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 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**2**	0	0	**2**	**2**	**2**	0	**4**	0	0	0	0	0	**1**	1	2	**8**
05:00 PM	0	0	**2**	2	2	1	0	3	0	0	0	0	0	1	1	2	7
05:15 PM	0	0	1	1	0	1	0	1	0	0	0	0	0	1	**2**	**3**	5
05:30 PM	0	0	2	2	0	1	0	1	0	0	0	0	0	1	0	1	4
Total Volume	2	0	5	7	4	5	0	9	0	0	0	0	0	4	4	8	24
% App. Total	28.6	0	71.4		44.4	55.6	0		0	0	0		0	50	50		
PHF	.250	.000	.625	.875	.500	.625	.000	.563	.000	.000	.000	.000	.000	1.00	.500	.667	.750

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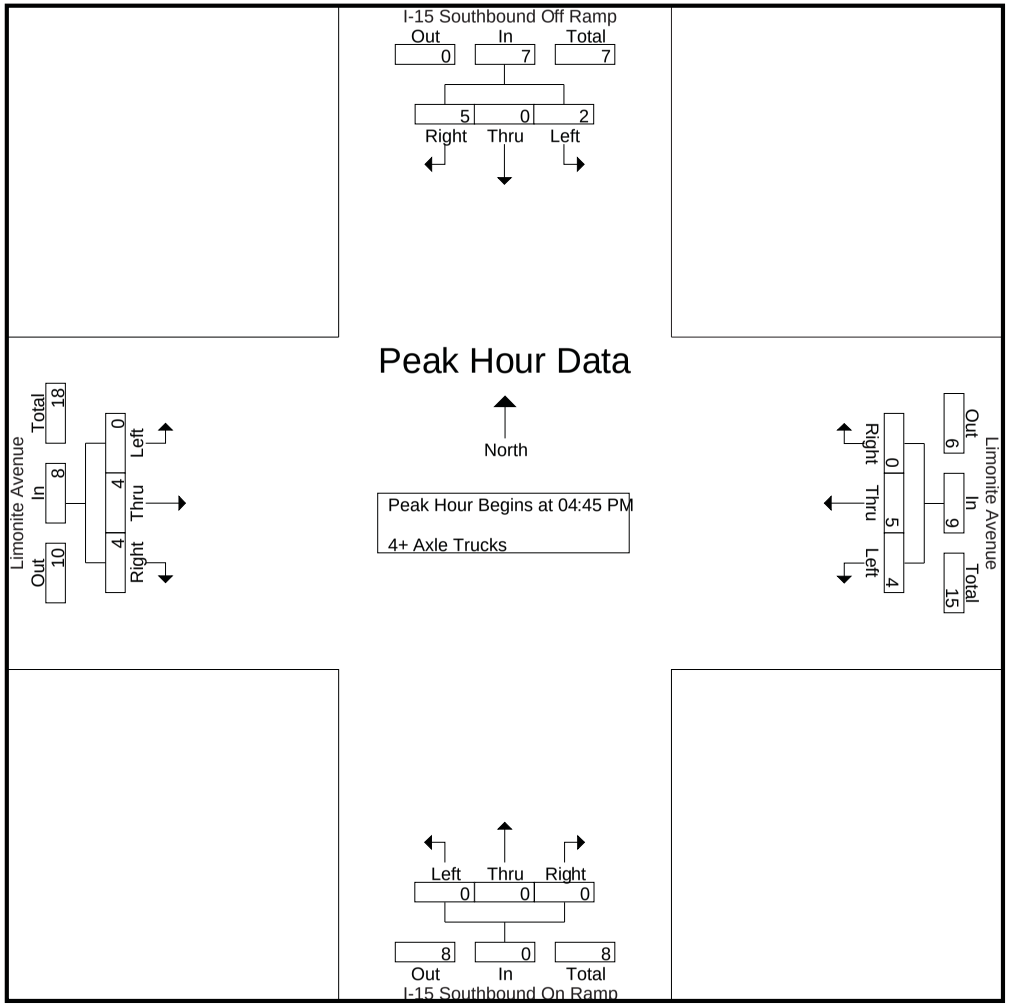
City of Eastvale
N/S: I-15 Southbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : ESV15SLIPM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



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City of Eastvale
N/S: I-15 Southbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : ESV15SLIPM
Site Code : 05114187
Start Date : 5/1/2014

	I-15 Southbound Off Ramp Southbound				Limonite Avenue Westbound				I-15 Southbound On Ramp Northbound				Limonite Avenue 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 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	04:45 PM				04:45 PM				04:45 PM				04:45 PM				
+0 mins.	**2**	0	0	**2**	**2**	**2**	0	**4**	0	0	0	0	0	**1**	1	2	
+15 mins.	0	0	**2**	2	2	1	0	3	0	0	0	0	0	1	1	2	
+30 mins.	0	0	1	1	0	1	0	1	0	0	0	0	0	1	**2**	**3**	
+45 mins.	0	0	2	2	0	1	0	1	0	0	0	0	0	1	0	1	
Total Volume	2	0	5	7	4	5	0	9	0	0	0	0	0	4	4	8	
% App. Total	28.6	0	71.4		44.4	55.6	0		0	0	0		0	50	50		
PHF	.250	.000	.625	.875	.500	.625	.000	.563	.000	.000	.000	.000	.000	1.000	.500	.667	

Location: Eastvale
N/S: I-15 Southbound Ramps
E/W: Limonite Avenue

Date: 5/1/2014
Weather: Clear

WEEKDAY

	North Leg I-15 Southbound Ramps	East Leg Limonite Avenue	South Leg I-15 Southbound Ramps	West Leg Limonite Avenue	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

	North Leg I-15 Southbound Ramps	East Leg Limonite Avenue	South Leg I-15 Southbound Ramps	West Leg Limonite Avenue	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
1:00 PM	0	0	0	0	0
1:15 PM	0	0	0	0	0
1:30 PM	0	0	0	0	0
1:45 PM	0	0	0	0	0
2:00 PM	0	0	0	0	0
2:15 PM	0	0	0	0	0
2:30 PM	0	0	0	0	0
2:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

	North Leg I-15 Southbound Ramps	East Leg Limonite Avenue	South Leg I-15 Southbound Ramps	West Leg Limonite Avenue	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

Location: Eastvale
N/S: I-15 Southbound Ramps
E/W: Limonite Avenue

Date: 5/1/2014
Weather: Clear

WEEKDAY

	North Leg I-15 Southbound Ramps	East Leg Limonite Avenue	South Leg I-15 Southbound Ramps	West Leg Limonite Avenue	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

	North Leg I-15 Southbound Ramps	East Leg Limonite Avenue	South Leg I-15 Southbound Ramps	West Leg Limonite Avenue	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
1:00 PM	0	0	0	0	0
1:15 PM	0	0	0	0	0
1:30 PM	0	0	0	0	0
1:45 PM	0	0	0	0	0
2:00 PM	0	0	0	0	0
2:15 PM	0	0	0	0	0
2:30 PM	0	0	0	0	0
2:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

	North Leg I-15 Southbound Ramps	East Leg Limonite Avenue	South Leg I-15 Southbound Ramps	West Leg Limonite Avenue	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

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City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIAM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	I-15 Northbound On Ramp Southbound					Limonite Avenue Westbound					I-15 Northbound Off Ramp Northbound					Limonite Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	198	89	0	287	64	0	62	0	126	179	79	0	0	258	0	671	671
07:15 AM	0	0	0	0	0	0	248	77	7	325	42	1	60	1	103	177	89	0	0	266	8	694	702
07:30 AM	0	0	0	0	0	0	262	87	15	349	49	1	61	11	111	160	131	0	0	291	26	751	777
07:45 AM	0	0	0	0	0	0	215	68	18	283	50	0	89	50	139	137	114	0	0	251	68	673	741
Total	0	0	0	0	0	0	923	321	40	1244	205	2	272	62	479	653	413	0	0	1066	102	2789	2891
08:00 AM	0	0	0	0	0	0	176	55	25	231	74	2	61	35	137	161	108	0	0	269	60	637	697
08:15 AM	0	0	0	0	0	0	211	68	16	279	46	1	66	34	113	166	102	0	0	268	50	660	710
08:30 AM	0	0	0	0	0	0	218	63	24	281	63	0	74	41	137	155	122	0	0	277	65	695	760
08:45 AM	0	0	0	0	0	0	201	44	15	245	85	0	90	55	175	94	111	0	0	205	70	625	695
Total	0	0	0	0	0	0	806	230	80	1036	268	3	291	165	562	576	443	0	0	1019	245	2617	2862
Grand Total	0	0	0	0	0	0	1729	551	120	2280	473	5	563	227	1041	1229	856	0	0	2085	347	5406	5753
Apprch %	0	0	0			0	75.8	24.2			45.4	0.5	54.1			58.9	41.1	0					
Total %	0	0	0		0	0	32	10.2		42.2	8.7	0.1	10.4		19.3	22.7	15.8	0		38.6	6	94	
Passenger Vehicles	0	0	0		0	0	1629	532		2279	436	3	518		1170	1183	813	0		1996	0	0	5445
% Passenger Vehicles	0	0	0	0	0	0	94.2	96.6	98.3	95	92.2	60	92	93.8	92.3	96.3	95	0	0	95.7	0	0	94.6
Large 2 Axle Vehicles	0	0	0		0	0	71	10		81	20	2	25		53	23	31	0		54	0	0	188
% Large 2 Axle Vehicles	0	0	0	0	0	0	4.1	1.8	0	3.4	4.2	40	4.4	2.6	4.2	1.9	3.6	0	0	2.6	0	0	3.3
3 Axle Vehicles	0	0	0		0	0	10	1		11	2	0	15		22	9	4	0		13	0	0	46
% 3 Axle Vehicles	0	0	0	0	0	0	0.6	0.2	0	0.5	0.4	0	2.7	2.2	1.7	0.7	0.5	0	0	0.6	0	0	0.8
4+ Axle Trucks	0	0	0		0	0	19	8		29	15	0	5		23	14	8	0		22	0	0	74
% 4+ Axle Trucks	0	0	0	0	0	0	1.1	1.5	1.7	1.2	3.2	0	0.9	1.3	1.8	1.1	0.9	0	0	1.1	0	0	1.3

	I-15 Northbound On Ramp Southbound				Limonite Avenue Westbound				I-15 Northbound Off Ramp Northbound				Limonite Avenue 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 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	198	**89**	287	**64**	0	62	126	**179**	79	0	258	671
07:15 AM	0	0	0	0	0	248	77	325	42	**1**	60	103	177	89	0	266	694
07:30 AM	0	0	0	0	0	**262**	87	**349**	49	1	61	111	160	**131**	0	**291**	**751**
07:45 AM	0	0	0	0	0	215	68	283	50	0	**89**	**139**	137	114	0	251	673
Total Volume	0	0	0	0	0	923	321	1244	205	2	272	479	653	413	0	1066	2789
% App. Total	0	0	0		0	74.2	25.8		42.8	0.4	56.8		61.3	38.7	0		
PHF	.000	.000	.000	.000	.000	.881	.902	.891	.801	.500	.764	.862	.912	.788	.000	.916	.928

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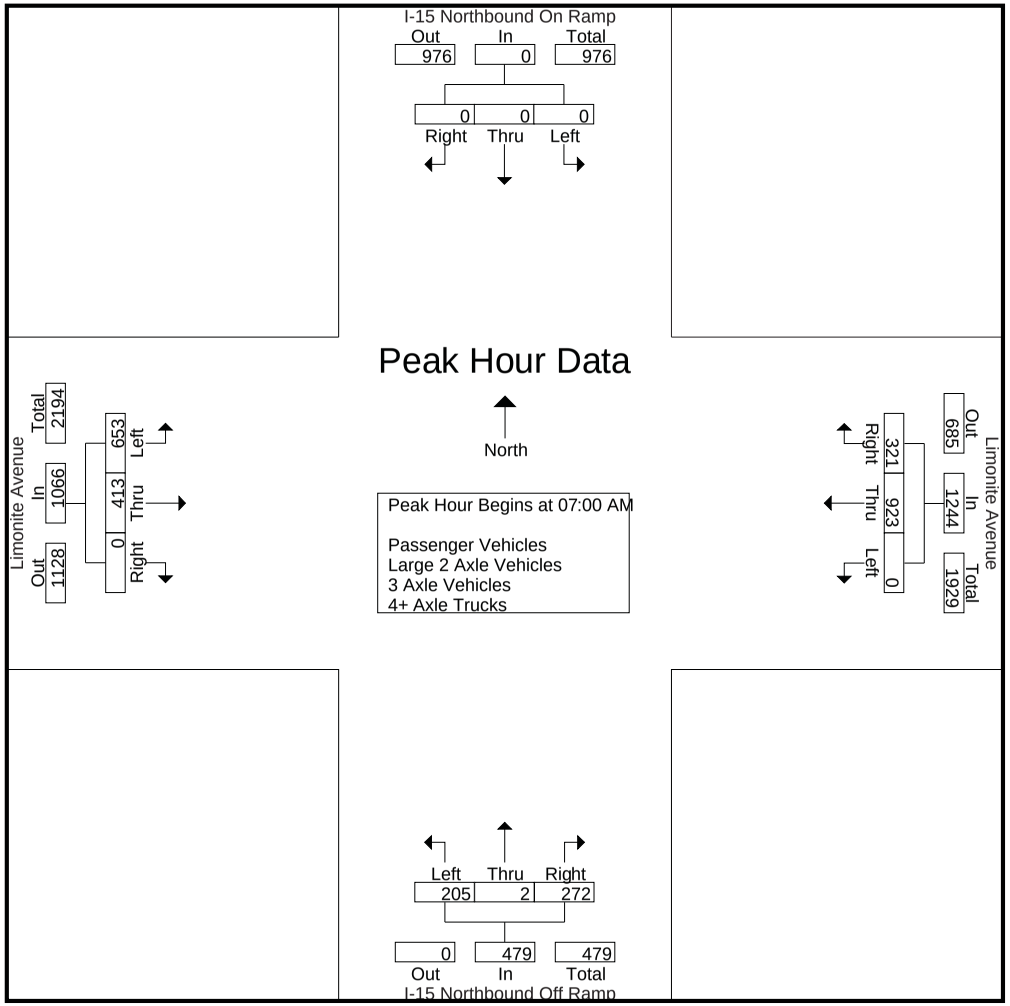
City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIAM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



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City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIAM
Site Code : 05114187
Start Date : 5/1/2014

	I-15 Northbound On Ramp Southbound				Limonite Avenue Westbound				I-15 Northbound Off Ramp Northbound				Limonite Avenue 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 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:00 AM				07:00 AM				08:00 AM				07:30 AM				
+0 mins.	0	0	0	0	0	198	**89**	287	74	**2**	61	137	160	**131**	0	**291**	
+15 mins.	0	0	0	0	0	248	77	325	46	1	66	113	137	114	0	251	
+30 mins.	0	0	0	0	0	**262**	87	**349**	63	0	74	137	161	108	0	269	
+45 mins.	0	0	0	0	0	215	68	283	**85**	0	**90**	**175**	**166**	102	0	268	
Total Volume	0	0	0	0	0	923	321	1244	268	3	291	562	624	455	0	1079	
% App. Total	0	0	0		0	74.2	25.8		47.7	0.5	51.8		57.8	42.2	0		
PHF	.000	.000	.000	.000	.000	.881	.902	.891	.788	.375	.808	.803	.940	.868	.000	.927	

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City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIAM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- Passenger Vehicles

	I-15 Northbound On Ramp Southbound					Limonite Avenue Westbound					I-15 Northbound Off Ramp Northbound					Limonite Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	195	87	0	282	60	0	59	0	119	179	76	0	0	255	0	656	656
07:15 AM	0	0	0	0	0	0	239	74	7	313	36	1	55	1	92	171	84	0	0	255	8	660	668
07:30 AM	0	0	0	0	0	0	248	84	15	332	45	1	58	11	104	147	123	0	0	270	26	706	732
07:45 AM	0	0	0	0	0	0	198	64	17	262	46	0	87	50	133	130	110	0	0	240	67	635	702
Total	0	0	0	0	0	0	880	309	39	1189	187	2	259	62	448	627	393	0	0	1020	101	2657	2758
08:00 AM	0	0	0	0	0	0	165	54	25	219	70	1	57	34	128	157	102	0	0	259	59	606	665
08:15 AM	0	0	0	0	0	0	197	68	16	265	42	0	57	32	99	159	92	0	0	251	48	615	663
08:30 AM	0	0	0	0	0	0	201	60	24	261	58	0	65	35	123	149	120	0	0	269	59	653	712
08:45 AM	0	0	0	0	0	0	186	41	14	227	79	0	80	50	159	91	106	0	0	197	64	583	647
Total	0	0	0	0	0	0	749	223	79	972	249	1	259	151	509	556	420	0	0	976	230	2457	2687
Grand Total	0	0	0	0	0	0	1629	532	118	2161	436	3	518	213	957	1183	813	0	0	1996	331	5114	5445
Apprch %	0	0	0			0	75.4	24.6			45.6	0.3	54.1			59.3	40.7	0					
Total %	0	0	0		0	0	31.9	10.4		42.3	8.5	0.1	10.1		18.7	23.1	15.9	0		39	6.1	93.9	

	I-15 Northbound On Ramp Southbound				Limonite Avenue Westbound				I-15 Northbound Off Ramp Northbound				Limonite Avenue 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 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	195	**87**	282	**60**	0	59	119	**179**	76	0	255	656
07:15 AM	0	0	0	0	0	239	74	313	36	**1**	55	92	171	84	0	255	660
07:30 AM	0	0	0	0	0	**248**	84	**332**	45	1	58	104	147	**123**	0	**270**	**706**
07:45 AM	0	0	0	0	0	198	64	262	46	0	**87**	**133**	130	110	0	240	635
Total Volume	0	0	0	0	0	880	309	1189	187	2	259	448	627	393	0	1020	2657
% App. Total	0	0	0		0	74	26		41.7	0.4	57.8		61.5	38.5	0		
PHF	.000	.000	.000	.000	.000	.887	.888	.895	.779	.500	.744	.842	.876	.799	.000	.944	.941

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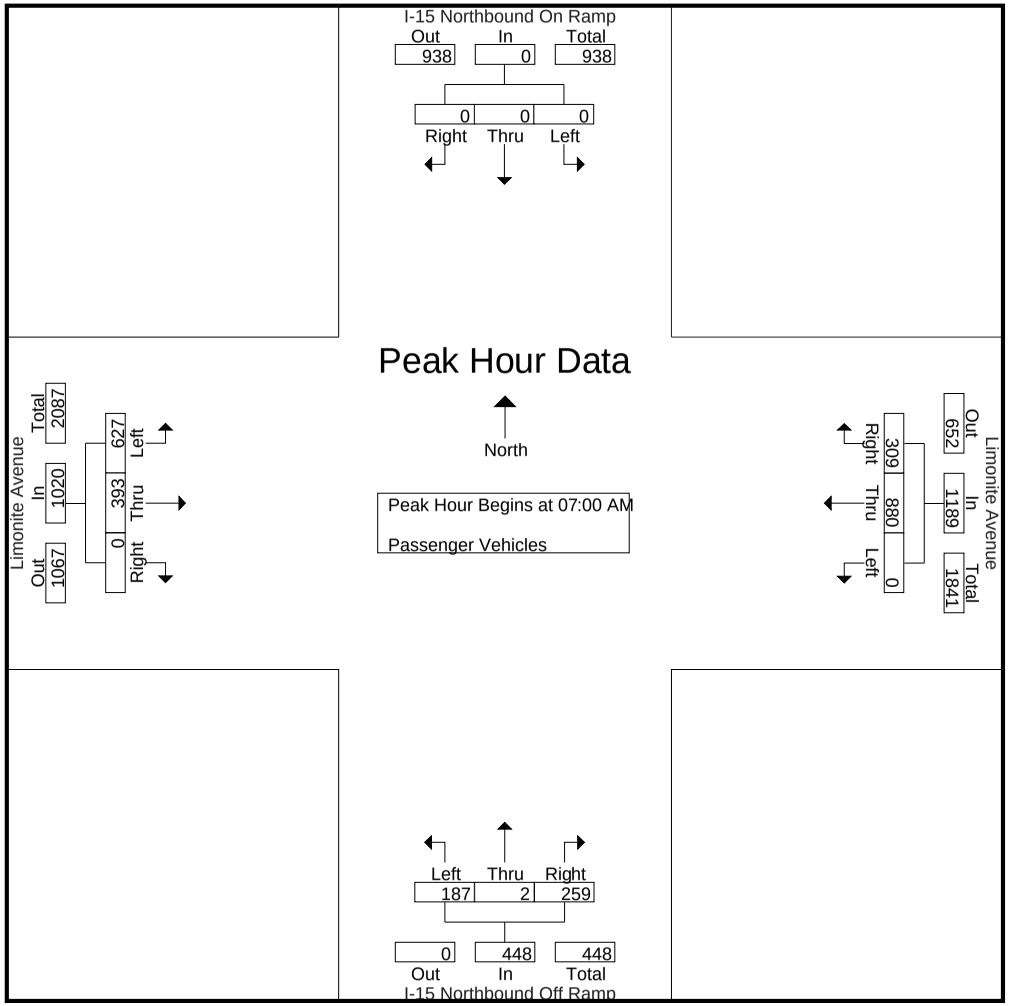
City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIAM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



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City of Jurupa Valley
N/S: I-15 Northbound Ramps
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File Name : JVY15NLIAM
Site Code : 05114187
Start Date : 5/1/2014

	I-15 Northbound On Ramp Southbound				Limonite Avenue Westbound				I-15 Northbound Off Ramp Northbound				Limonite Avenue 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 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:00 AM				07:00 AM				07:00 AM				07:00 AM				
+0 mins.	0	0	0	0	0	195	**87**	282	**60**	0	59	119	**179**	76	0	255	
+15 mins.	0	0	0	0	0	239	74	313	36	**1**	55	92	171	84	0	255	
+30 mins.	0	0	0	0	0	**248**	84	**332**	45	1	58	104	147	**123**	0	**270**	
+45 mins.	0	0	0	0	0	198	64	262	46	0	**87**	**133**	130	110	0	240	
Total Volume	0	0	0	0	0	880	309	1189	187	2	259	448	627	393	0	1020	
% App. Total	0	0	0		0	74	26		41.7	0.4	57.8		61.5	38.5	0		
PHF	.000	.000	.000	.000	.000	.887	.888	.895	.779	.500	.744	.842	.876	.799	.000	.944	

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File Name : JVY15NLIAM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- Large 2 Axle Vehicles

	I-15 Northbound On Ramp Southbound					Limonite Avenue Westbound					I-15 Northbound Off Ramp Northbound					Limonite Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	1	1	0	2	2	0	3	0	5	0	1	0	0	1	0	8	8
07:15 AM	0	0	0	0	0	0	8	2	0	10	2	0	3	0	5	3	4	0	0	7	0	22	22
07:30 AM	0	0	0	0	0	0	10	1	0	11	1	0	2	0	3	6	6	0	0	12	0	26	26
07:45 AM	0	0	0	0	0	0	13	2	0	15	3	0	2	0	5	4	3	0	0	7	0	27	27
Total	0	0	0	0	0	0	32	6	0	38	8	0	10	0	18	13	14	0	0	27	0	83	83
08:00 AM	0	0	0	0	0	0	7	0	0	7	4	1	3	1	8	2	5	0	0	7	1	22	23
08:15 AM	0	0	0	0	0	0	11	0	0	11	0	1	3	1	4	2	6	0	0	8	1	23	24
08:30 AM	0	0	0	0	0	0	12	2	0	14	4	0	5	3	9	5	2	0	0	7	3	30	33
08:45 AM	0	0	0	0	0	0	9	2	0	11	4	0	4	1	8	1	4	0	0	5	1	24	25
Total	0	0	0	0	0	0	39	4	0	43	12	2	15	6	29	10	17	0	0	27	6	99	105
Grand Total	0	0	0	0	0	0	71	10	0	81	20	2	25	6	47	23	31	0	0	54	6	182	188
Apprch %	0	0	0			0	87.7	12.3			42.6	4.3	53.2			42.6	57.4	0					
Total %	0	0	0		0	0	39	5.5		44.5	11	1.1	13.7		25.8	12.6	17	0		29.7	3.2	96.8	

	I-15 Northbound On Ramp Southbound				Limonite Avenue Westbound				I-15 Northbound Off Ramp Northbound				Limonite Avenue 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 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	1	1	2	2	0	**3**	**5**	0	1	0	1	8
07:15 AM	0	0	0	0	0	8	**2**	10	2	0	3	5	3	4	0	7	22
07:30 AM	0	0	0	0	0	10	1	11	1	0	2	3	**6**	**6**	0	**12**	26
07:45 AM	0	0	0	0	0	**13**	2	**15**	**3**	0	2	5	4	3	0	7	**27**
Total Volume	0	0	0	0	0	32	6	38	8	0	10	18	13	14	0	27	83
% App. Total	0	0	0		0	84.2	15.8		44.4	0	55.6		48.1	51.9	0		
PHF	.000	.000	.000	.000	.000	.615	.750	.633	.667	.000	.833	.900	.542	.583	.000	.563	.769

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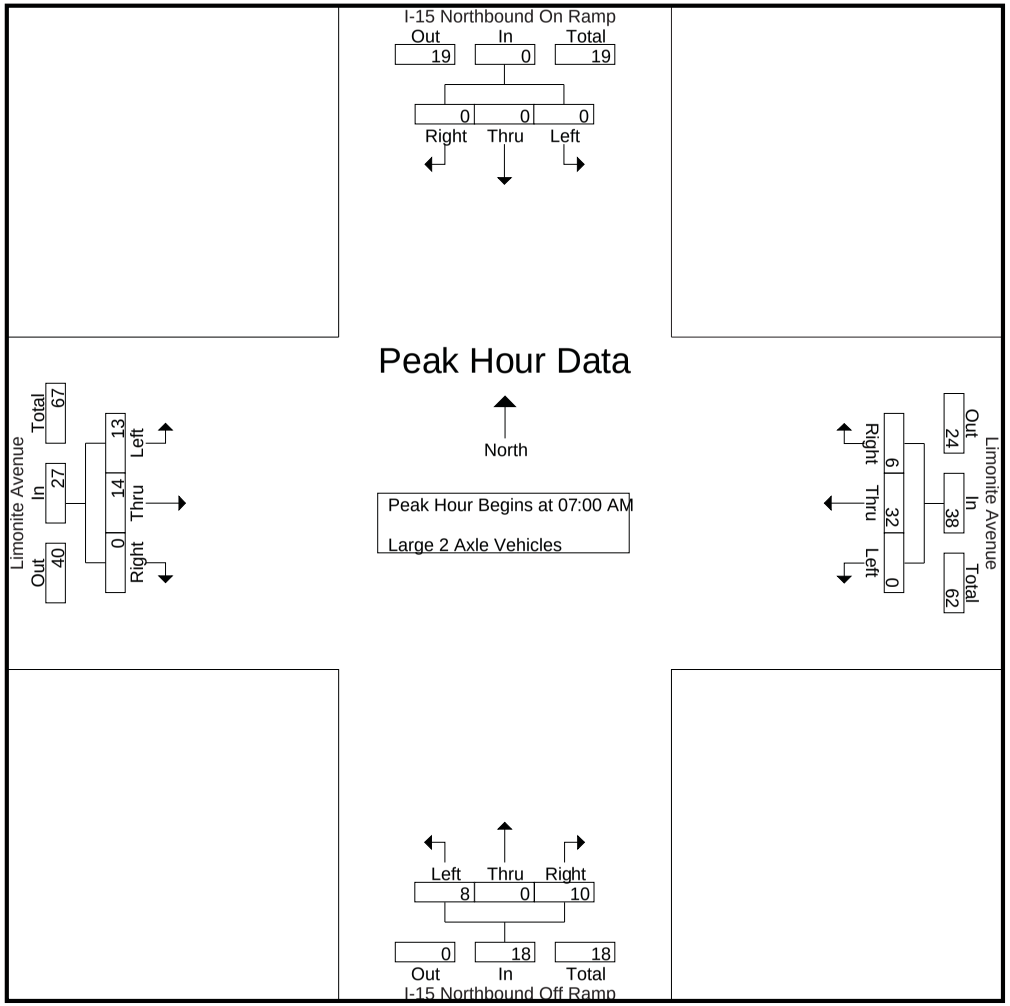
City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIAM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



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City of Jurupa Valley
N/S: I-15 Northbound Ramps
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File Name : JVY15NLIAM
Site Code : 05114187
Start Date : 5/1/2014

	I-15 Northbound On Ramp Southbound				Limonite Avenue Westbound				I-15 Northbound Off Ramp Northbound				Limonite Avenue 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 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:00 AM				07:00 AM				07:00 AM				07:00 AM				
+0 mins.	0	0	0	0	0	1	1	2	2	0	**3**	**5**	0	1	0	1	
+15 mins.	0	0	0	0	0	8	**2**	10	2	0	3	5	3	4	0	7	
+30 mins.	0	0	0	0	0	10	1	11	1	0	2	3	**6**	**6**	0	**12**	
+45 mins.	0	0	0	0	0	**13**	2	**15**	**3**	0	2	5	4	3	0	7	
Total Volume	0	0	0	0	0	32	6	38	8	0	10	18	13	14	0	27	
% App. Total	0	0	0		0	84.2	15.8		44.4	0	55.6		48.1	51.9	0		
PHF	.000	.000	.000	.000	.000	.615	.750	.633	.667	.000	.833	.900	.542	.583	.000	.563	

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PO Box 1178
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City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIAM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- 3 Axle Vehicles

	I-15 Northbound On Ramp Southbound					Limonite Avenue Westbound					I-15 Northbound Off Ramp Northbound					Limonite Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	1	0	0	0	1	0	3	3
07:30 AM	0	0	0	0	0	0	4	0	0	4	1	0	0	0	1	3	0	0	0	3	0	8	8
07:45 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	1	1	0	0	2	0	5	5
Total	0	0	0	0	0	0	7	0	0	7	1	0	2	0	3	5	2	0	0	7	0	17	17
08:00 AM	0	0	0	0	0	0	0	1	0	1	0	0	1	0	1	1	0	0	0	1	0	3	3
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	1	2	0	0	3	0	7	7
08:30 AM	0	0	0	0	0	0	2	0	0	2	0	0	4	3	4	1	0	0	0	1	3	7	10
08:45 AM	0	0	0	0	0	0	1	0	0	1	1	0	4	2	5	1	0	0	0	1	2	7	9
Total	0	0	0	0	0	0	3	1	0	4	1	0	13	5	14	4	2	0	0	6	5	24	29
Grand Total	0	0	0	0	0	0	10	1	0	11	2	0	15	5	17	9	4	0	0	13	5	41	46
Apprch %	0	0	0			0	90.9	9.1			11.8	0	88.2			69.2	30.8	0					
Total %	0	0	0		0	0	24.4	2.4		26.8	4.9	0	36.6		41.5	22	9.8	0		31.7	10.9	89.1	

	I-15 Northbound On Ramp Southbound				Limonite Avenue Westbound				I-15 Northbound Off Ramp Northbound				Limonite Avenue 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 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	1	1
07:15 AM	0	0	0	0	0	0	0	0	0	0	**2**	**2**	1	0	0	1	3
07:30 AM	0	0	0	0	0	**4**	0	**4**	**1**	0	0	1	**3**	0	0	**3**	**8**
07:45 AM	0	0	0	0	0	3	0	3	0	0	0	0	1	1	0	2	5
Total Volume	0	0	0	0	0	7	0	7	1	0	2	3	5	2	0	7	17
% App. Total	0	0	0		0	100	0		33.3	0	66.7		71.4	28.6	0		
PHF	.000	.000	.000	.000	.000	.438	.000	.438	.250	.000	.250	.375	.417	.500	.000	.583	.531

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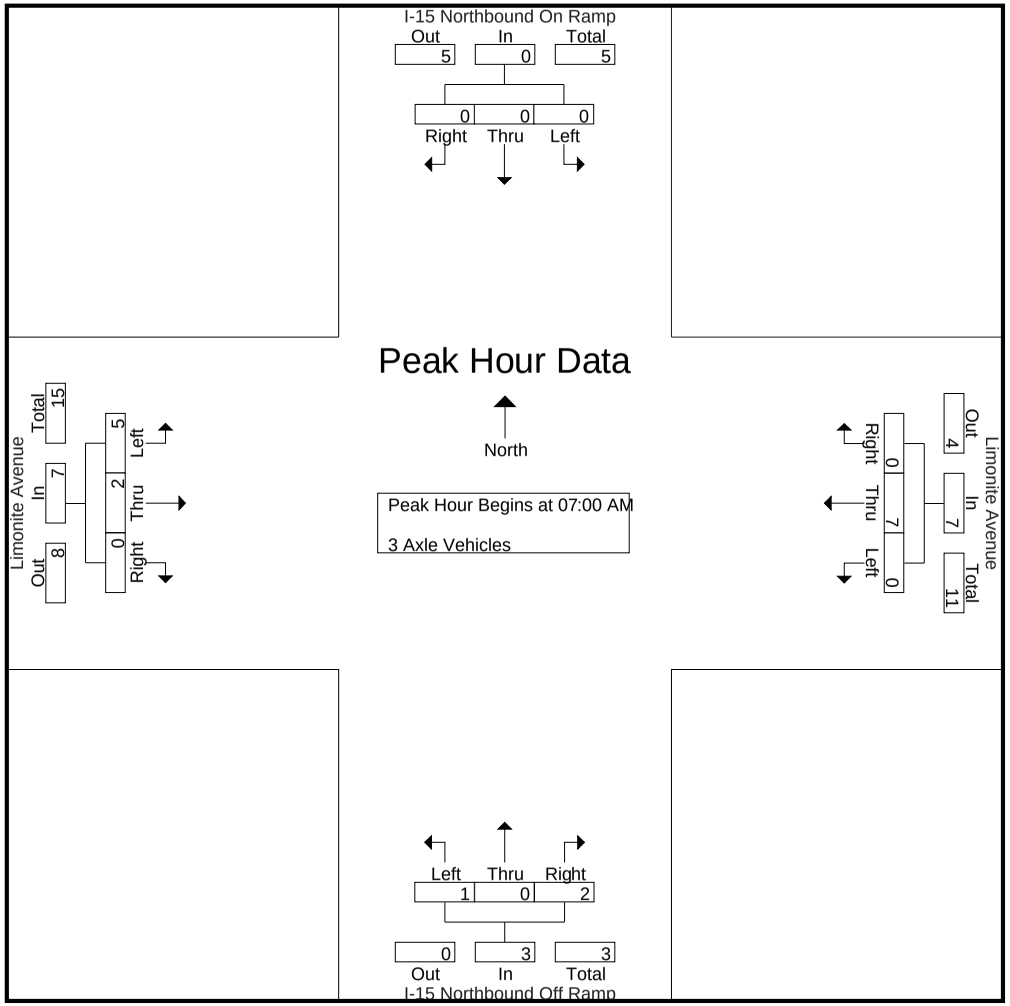
City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIAM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



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City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIAM
Site Code : 05114187
Start Date : 5/1/2014

	I-15 Northbound On Ramp Southbound				Limonite Avenue Westbound				I-15 Northbound Off Ramp Northbound				Limonite Avenue 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 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:00 AM				07:00 AM				07:00 AM				07:00 AM				
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	1	
+15 mins.	0	0	0	0	0	0	0	0	0	0	**2**	**2**	1	0	0	1	
+30 mins.	0	0	0	0	0	**4**	0	**4**	**1**	0	0	1	**3**	0	0	**3**	
+45 mins.	0	0	0	0	0	3	0	3	0	0	0	0	1	1	0	2	
Total Volume	0	0	0	0	0	7	0	7	1	0	2	3	5	2	0	7	
% App. Total	0	0	0		0	100	0		33.3	0	66.7		71.4	28.6	0		
PHF	.000	.000	.000	.000	.000	.438	.000	.438	.250	.000	.250	.375	.417	.500	.000	.583	

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City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIAM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- 4+ Axle Trucks

	I-15 Northbound On Ramp Southbound					Limonite Avenue Westbound					I-15 Northbound Off Ramp Northbound					Limonite Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	0	0	0	0	0	0	2	1	0	3	2	0	0	0	2	0	1	0	0	1	0	6	6
07:15 AM	0	0	0	0	0	0	1	1	0	2	4	0	0	0	4	2	1	0	0	3	0	9	9
07:30 AM	0	0	0	0	0	0	0	2	0	2	2	0	1	0	3	4	2	0	0	6	0	11	11
07:45 AM	0	0	0	0	0	0	1	2	1	3	1	0	0	0	1	2	0	0	0	2	1	6	7
Total	0	0	0	0	0	0	4	6	1	10	9	0	1	0	10	8	4	0	0	12	1	32	33
08:00 AM	0	0	0	0	0	0	4	0	0	4	0	0	0	0	0	1	1	0	0	2	0	6	6
08:15 AM	0	0	0	0	0	0	3	0	0	3	4	0	2	1	6	4	2	0	0	6	1	15	16
08:30 AM	0	0	0	0	0	0	3	1	0	4	1	0	0	0	1	0	0	0	0	0	0	5	5
08:45 AM	0	0	0	0	0	0	5	1	1	6	1	0	2	2	3	1	1	0	0	2	3	11	14
Total	0	0	0	0	0	0	15	2	1	17	6	0	4	3	10	6	4	0	0	10	4	37	41
Grand Total	0	0	0	0	0	0	19	8	2	27	15	0	5	3	20	14	8	0	0	22	5	69	74
Apprch %	0	0	0			0	70.4	29.6			75	0	25			63.6	36.4	0					
Total %	0	0	0		0	0	27.5	11.6		39.1	21.7	0	7.2		29	20.3	11.6	0		31.9	6.8	93.2	

	I-15 Northbound On Ramp Southbound				Limonite Avenue Westbound				I-15 Northbound Off Ramp Northbound				Limonite Avenue 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 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	**2**	1	**3**	2	0	0	2	0	1	0	1	6
07:15 AM	0	0	0	0	0	1	1	2	**4**	0	0	**4**	2	1	0	3	9
07:30 AM	0	0	0	0	0	0	**2**	2	2	0	**1**	3	**4**	**2**	0	**6**	**11**
07:45 AM	0	0	0	0	0	1	2	3	1	0	0	1	2	0	0	2	6
Total Volume	0	0	0	0	0	4	6	10	9	0	1	10	8	4	0	12	32
% App. Total	0	0	0		0	40	60		90	0	10		66.7	33.3	0		
PHF	.000	.000	.000	.000	.000	.500	.750	.833	.563	.000	.250	.625	.500	.500	.000	.500	.727

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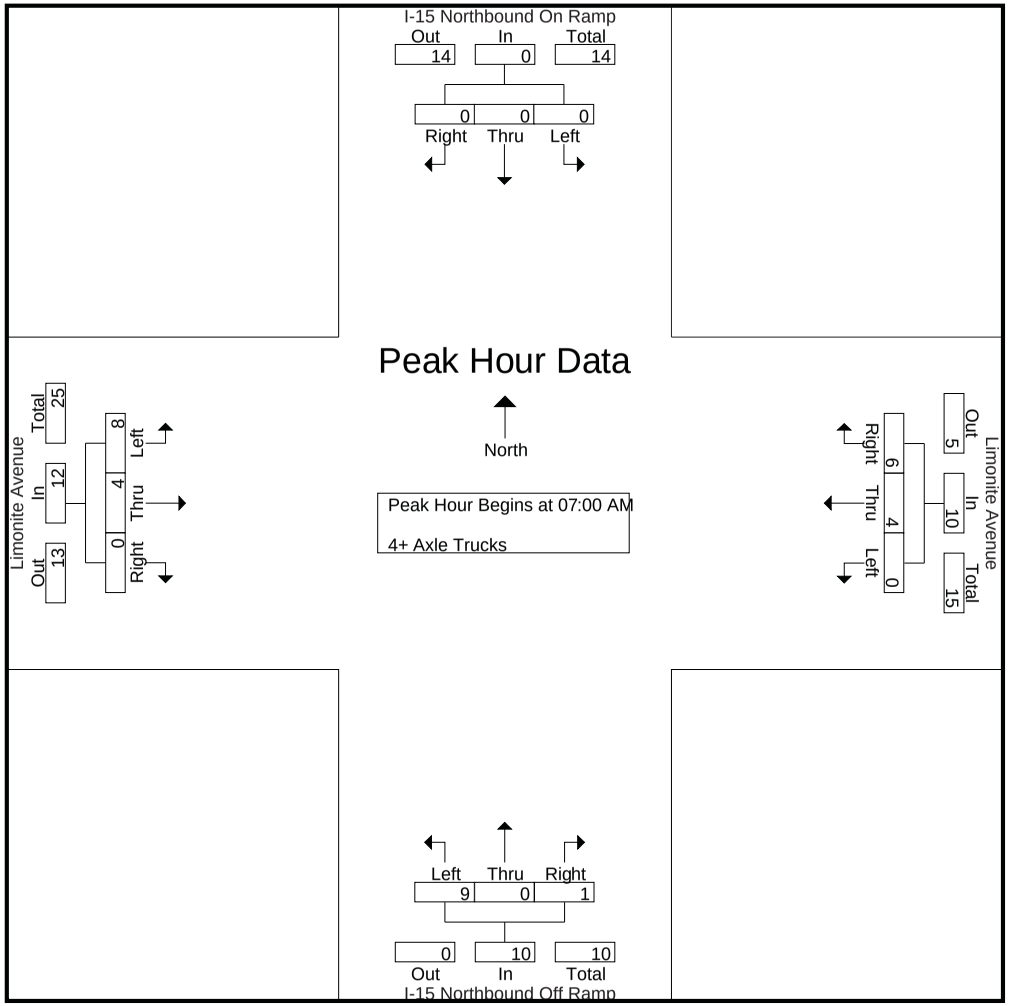
City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIAM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



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City of Jurupa Valley
N/S: I-15 Northbound Ramps
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Site Code : 05114187
Start Date : 5/1/2014

	I-15 Northbound On Ramp Southbound				Limonite Avenue Westbound				I-15 Northbound Off Ramp Northbound				Limonite Avenue 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 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:00 AM				07:00 AM				07:00 AM				07:00 AM				
+0 mins.	0	0	0	0	0	**2**	1	**3**	2	0	0	2	0	1	0	1	
+15 mins.	0	0	0	0	0	1	1	2	**4**	0	0	**4**	2	1	0	3	
+30 mins.	0	0	0	0	0	0	**2**	2	2	0	**1**	3	**4**	**2**	0	**6**	
+45 mins.	0	0	0	0	0	1	2	3	1	0	0	1	2	0	0	2	
Total Volume	0	0	0	0	0	4	6	10	9	0	1	10	8	4	0	12	
% App. Total	0	0	0		0	40	60		90	0	10		66.7	33.3	0		
PHF	.000	.000	.000	.000	.000	.500	.750	.833	.563	.000	.250	.625	.500	.500	.000	.500	

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City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIPM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

	I-15 Northbound On Ramp Southbound					Limonite Avenue Westbound					I-15 Northbound Off Ramp Northbound					Limonite Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	199	47	15	246	78	0	143	72	221	120	183	0	0	303	87	770	857
04:15 PM	0	0	0	0	0	0	228	73	18	301	52	0	145	63	197	128	221	0	0	349	81	847	928
04:30 PM	0	0	0	0	0	0	193	65	26	258	54	0	134	59	188	115	187	0	0	302	85	748	833
04:45 PM	0	0	0	0	0	0	232	44	15	276	72	0	156	70	228	111	197	0	0	308	85	812	897
Total	0	0	0	0	0	0	852	229	74	1081	256	0	578	264	834	474	788	0	0	1262	338	3177	3515
05:00 PM	0	0	0	0	0	0	250	44	19	294	79	0	164	52	243	98	230	0	0	328	71	865	936
05:15 PM	0	0	0	0	0	0	215	46	25	261	78	10	151	70	239	111	201	0	0	312	95	812	907
05:30 PM	0	0	0	0	0	0	226	41	23	267	86	7	132	58	225	82	223	0	0	305	81	797	878
05:45 PM	0	0	0	0	0	0	229	40	15	269	89	0	154	62	243	113	208	0	0	321	77	833	910
Total	0	0	0	0	0	0	920	171	82	1091	332	17	601	242	950	404	862	0	0	1266	324	3307	3631
Grand Total	0	0	0	0	0	0	1772	400	156	2172	588	17	1179	506	1784	878	1650	0	0	2528	662	6484	7146
Apprch %	0	0	0			0	81.6	18.4			33	1	66.1			34.7	65.3	0					
Total %	0	0	0		0	0	27.3	6.2		33.5	9.1	0.3	18.2		27.5	13.5	25.4	0		39	9.3	90.7	
Passenger Vehicles	0	0	0		0	0	1743	386		2282	577	17	1156		2233	853	1626	0		2479	0	0	6994
% Passenger Vehicles	0	0	0	0	0	0	98.4	96.5	98.1	98	98.1	100	98	95.5	97.5	97.2	98.5	0	0	98.1	0	0	97.9
Large 2 Axle Vehicles	0	0	0		0	0	21	7		30	4	0	14		36	19	20	0		39	0	0	105
% Large 2 Axle Vehicles	0	0	0	0	0	0	1.2	1.8	1.3	1.3	0.7	0	1.2	3.6	1.6	2.2	1.2	0	0	1.5	0	0	1.5
3 Axle Vehicles	0	0	0		0	0	5	2		7	2	0	3		6	1	1	0		2	0	0	15
% 3 Axle Vehicles	0	0	0	0	0	0	0.3	0.5	0	0.3	0.3	0	0.3	0.2	0.3	0.1	0.1	0	0	0.1	0	0	0.2
4+ Axle Trucks	0	0	0		0	0	3	5		9	5	0	6		15	5	3	0		8	0	0	32
% 4+ Axle Trucks	0	0	0	0	0	0	0.2	1.2	0.6	0.4	0.9	0	0.5	0.8	0.7	0.6	0.2	0	0	0.3	0	0	0.4

	I-15 Northbound On Ramp Southbound				Limonite Avenue Westbound				I-15 Northbound Off Ramp Northbound				Limonite Avenue 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	**250**	44	**294**	79	0	**164**	**243**	98	**230**	0	**328**	**865**
05:15 PM	0	0	0	0	0	215	**46**	261	78	**10**	151	239	111	201	0	312	812
05:30 PM	0	0	0	0	0	226	41	267	86	7	132	225	82	223	0	305	797
05:45 PM	0	0	0	0	0	229	40	269	**89**	0	154	243	**113**	208	0	321	833
Total Volume	0	0	0	0	0	920	171	1091	332	17	601	950	404	862	0	1266	3307
% App. Total	0	0	0		0	84.3	15.7		34.9	1.8	63.3		31.9	68.1	0		
PHF	.000	.000	.000	.000	.000	.920	.929	.928	.933	.425	.916	.977	.894	.937	.000	.965	.956

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City of Jurupa Valley
N/S: I-15 Northbound Ramps
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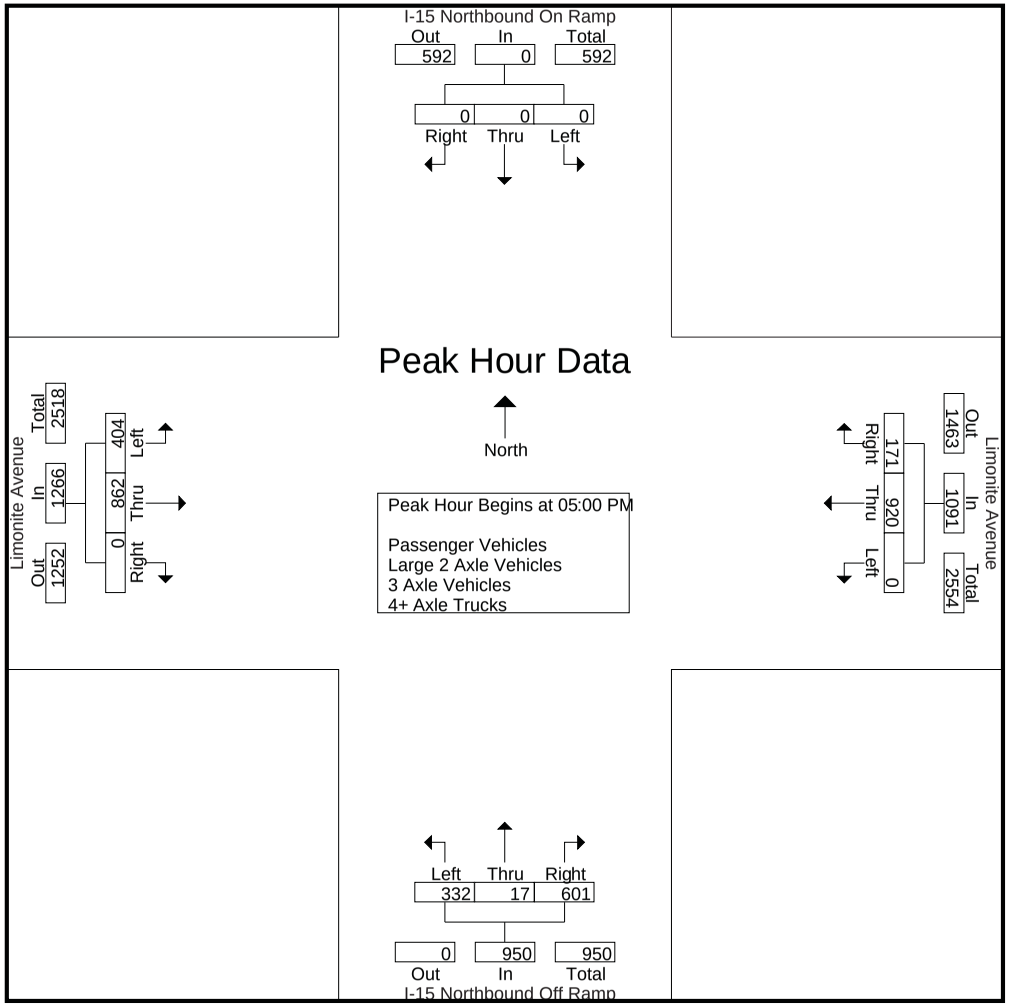
File Name : JVY15NLIPM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



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City of Jurupa Valley
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File Name : JVY15NLIPM
Site Code : 05114187
Start Date : 5/1/2014

	I-15 Northbound On Ramp Southbound				Limonite Avenue Westbound				I-15 Northbound Off Ramp Northbound				Limonite Avenue 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	04:00 PM				04:15 PM				05:00 PM				04:15 PM				
+0 mins.	0	0	0	0	0	228	**73**	**301**	79	0	**164**	**243**	**128**	221	0	**349**	
+15 mins.	0	0	0	0	0	193	65	258	78	**10**	151	239	115	187	0	302	
+30 mins.	0	0	0	0	0	232	44	276	86	7	132	225	111	197	0	308	
+45 mins.	0	0	0	0	0	**250**	44	294	**89**	0	154	243	98	**230**	0	328	
Total Volume	0	0	0	0	0	903	226	1129	332	17	601	950	452	835	0	1287	
% App. Total	0	0	0		0	80	20		34.9	1.8	63.3		35.1	64.9	0		
PHF	.000	.000	.000	.000	.000	.903	.774	.938	.933	.425	.916	.977	.883	.908	.000	.922	

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File Name : JVY15NLIPM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- Passenger Vehicles

	I-15 Northbound On Ramp Southbound					Limonite Avenue Westbound					I-15 Northbound Off Ramp Northbound					Limonite Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	192	46	14	238	78	0	136	65	214	118	180	0	0	298	79	750	829
04:15 PM	0	0	0	0	0	0	223	72	18	295	52	0	141	59	193	126	217	0	0	343	77	831	908
04:30 PM	0	0	0	0	0	0	190	60	26	250	53	0	129	54	182	110	184	0	0	294	80	726	806
04:45 PM	0	0	0	0	0	0	227	40	15	267	69	0	156	69	225	106	194	0	0	300	84	792	876
Total	0	0	0	0	0	0	832	218	73	1050	252	0	562	247	814	460	775	0	0	1235	320	3099	3419
05:00 PM	0	0	0	0	0	0	246	42	19	288	78	0	163	50	241	93	225	0	0	318	69	847	916
05:15 PM	0	0	0	0	0	0	214	45	24	259	76	10	148	69	234	109	198	0	0	307	93	800	893
05:30 PM	0	0	0	0	0	0	222	41	23	263	84	7	131	58	222	82	223	0	0	305	81	790	871
05:45 PM	0	0	0	0	0	0	229	40	14	269	87	0	152	59	239	109	205	0	0	314	73	822	895
Total	0	0	0	0	0	0	911	168	80	1079	325	17	594	236	936	393	851	0	0	1244	316	3259	3575
Grand Total	0	0	0	0	0	0	1743	386	153	2129	577	17	1156	483	1750	853	1626	0	0	2479	636	6358	6994
Apprch %	0	0	0			0	81.9	18.1			33	1	66.1			34.4	65.6	0					
Total %	0	0	0		0	0	27.4	6.1		33.5	9.1	0.3	18.2		27.5	13.4	25.6	0		39	9.1	90.9	

	I-15 Northbound On Ramp Southbound				Limonite Avenue Westbound				I-15 Northbound Off Ramp Northbound				Limonite Avenue 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 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	**246**	42	**288**	78	0	**163**	**241**	93	**225**	0	**318**	**847**
05:15 PM	0	0	0	0	0	214	**45**	259	76	**10**	148	234	**109**	198	0	307	800
05:30 PM	0	0	0	0	0	222	41	263	84	7	131	222	82	223	0	305	790
05:45 PM	0	0	0	0	0	229	40	269	**87**	0	152	239	109	205	0	314	822
Total Volume	0	0	0	0	0	911	168	1079	325	17	594	936	393	851	0	1244	3259
% App. Total	0	0	0		0	84.4	15.6		34.7	1.8	63.5		31.6	68.4	0		
PHF	.000	.000	.000	.000	.000	.926	.933	.937	.934	.425	.911	.971	.901	.946	.000	.978	.962

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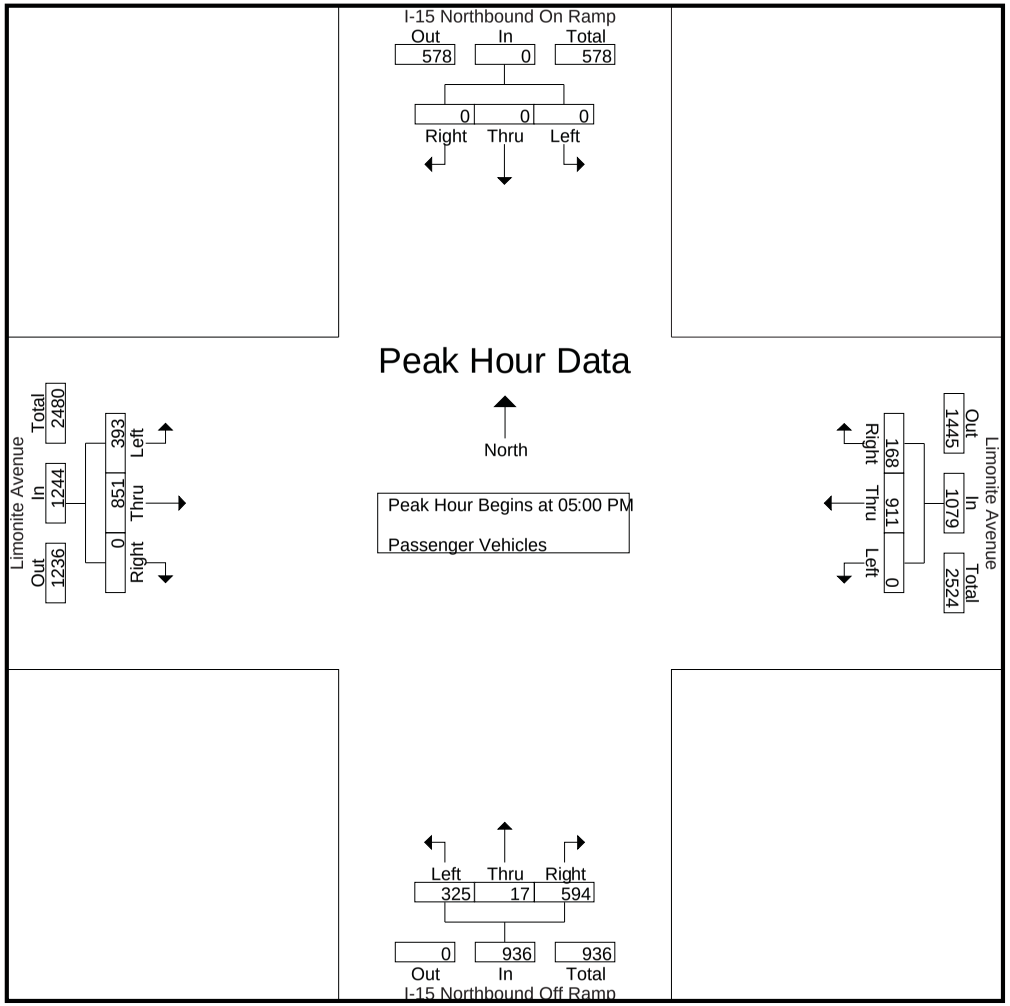
City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIPM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



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City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIPM
Site Code : 05114187
Start Date : 5/1/2014

	I-15 Northbound On Ramp Southbound				Limonite Avenue Westbound				I-15 Northbound Off Ramp Northbound				Limonite Avenue 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 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	05:00 PM				05:00 PM				05:00 PM				05:00 PM				
+0 mins.	0	0	0	0	0	**246**	42	**288**	78	0	**163**	**241**	93	**225**	0	**318**	
+15 mins.	0	0	0	0	0	214	**45**	259	76	**10**	148	234	**109**	198	0	307	
+30 mins.	0	0	0	0	0	222	41	263	84	7	131	222	82	223	0	305	
+45 mins.	0	0	0	0	0	229	40	269	**87**	0	152	239	109	205	0	314	
Total Volume	0	0	0	0	0	911	168	1079	325	17	594	936	393	851	0	1244	
% App. Total	0	0	0		0	84.4	15.6		34.7	1.8	63.5		31.6	68.4	0		
PHF	.000	.000	.000	.000	.000	.926	.933	.937	.934	.425	.911	.971	.901	.946	.000	.978	

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City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIPM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- Large 2 Axle Vehicles

	I-15 Northbound On Ramp Southbound					Limonite Avenue Westbound					I-15 Northbound Off Ramp Northbound					Limonite Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	7	1	1	8	0	0	3	5	3	2	3	0	0	5	6	16	22
04:15 PM	0	0	0	0	0	0	2	1	0	3	0	0	1	2	1	1	3	0	0	4	2	8	10
04:30 PM	0	0	0	0	0	0	2	2	0	4	0	0	3	4	3	4	2	0	0	6	4	13	17
04:45 PM	0	0	0	0	0	0	3	2	0	5	2	0	0	1	2	3	3	0	0	6	1	13	14
Total	0	0	0	0	0	0	14	6	1	20	2	0	7	12	9	10	11	0	0	21	13	50	63
05:00 PM	0	0	0	0	0	0	2	1	0	3	0	0	1	2	1	5	4	0	0	9	2	13	15
05:15 PM	0	0	0	0	0	0	1	0	0	1	1	0	3	1	4	2	3	0	0	5	1	10	11
05:30 PM	0	0	0	0	0	0	4	0	0	4	0	0	1	0	1	0	0	0	0	0	0	5	5
05:45 PM	0	0	0	0	0	0	0	0	1	0	1	0	2	3	3	2	2	0	0	4	4	7	11
Total	0	0	0	0	0	0	7	1	1	8	2	0	7	6	9	9	9	0	0	18	7	35	42
Grand Total	0	0	0	0	0	0	21	7	2	28	4	0	14	18	18	19	20	0	0	39	20	85	105
Apprch %	0	0	0			0	75	25			22.2	0	77.8			48.7	51.3	0					
Total %	0	0	0		0	0	24.7	8.2		32.9	4.7	0	16.5		21.2	22.4	23.5	0		45.9	19	81	

	I-15 Northbound On Ramp Southbound				Limonite Avenue Westbound				I-15 Northbound Off Ramp Northbound				Limonite Avenue 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 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	2	**1**	3	0	0	1	1	**5**	**4**	0	**9**	**13**
05:15 PM	0	0	0	0	0	1	0	1	**1**	0	**3**	**4**	2	3	0	5	10
05:30 PM	0	0	0	0	0	**4**	0	**4**	0	0	1	1	0	0	0	0	5
05:45 PM	0	0	0	0	0	0	0	0	1	0	2	3	2	2	0	4	7
Total Volume	0	0	0	0	0	7	1	8	2	0	7	9	9	9	0	18	35
% App. Total	0	0	0		0	87.5	12.5		22.2	0	77.8		50	50	0		
PHF	.000	.000	.000	.000	.000	.438	.250	.500	.500	.000	.583	.563	.450	.563	.000	.500	.673

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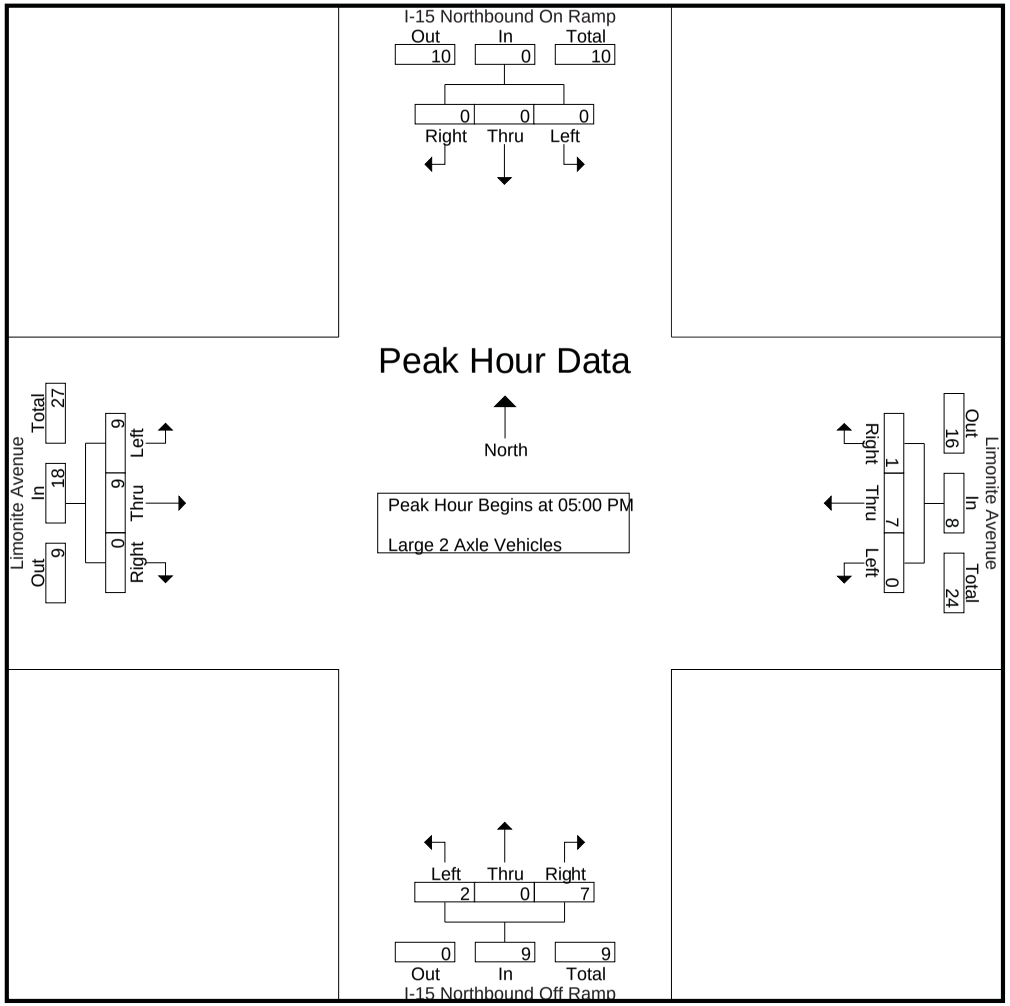
City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIPM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



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City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIPM
Site Code : 05114187
Start Date : 5/1/2014

	I-15 Northbound On Ramp Southbound				Limonite Avenue Westbound				I-15 Northbound Off Ramp Northbound				Limonite Avenue 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 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	05:00 PM				05:00 PM				05:00 PM				05:00 PM				
+0 mins.	0	0	0	0	0	2	**1**	3	0	0	1	1	**5**	**4**	0	**9**	
+15 mins.	0	0	0	0	0	1	0	1	**1**	0	**3**	**4**	2	3	0	5	
+30 mins.	0	0	0	0	0	**4**	0	**4**	0	0	1	1	0	0	0	0	
+45 mins.	0	0	0	0	0	0	0	0	1	0	2	3	2	2	0	4	
Total Volume	0	0	0	0	0	7	1	8	2	0	7	9	9	9	0	18	
% App. Total	0	0	0		0	87.5	12.5		22.2	0	77.8		50	50	0		
PHF	.000	.000	.000	.000	.000	.438	.250	.500	.500	.000	.583	.563	.450	.563	.000	.500	

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City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIPM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- 3 Axle Vehicles

	I-15 Northbound On Ramp Southbound					Limonite Avenue Westbound					I-15 Northbound Off Ramp Northbound					Limonite Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	2	0	0	2	0	0	2	1	2	0	0	0	0	0	1	4	5
04:30 PM	0	0	0	0	0	0	0	1	0	1	1	0	1	0	2	0	0	0	0	0	0	3	3
04:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	1	0	2	2
Total	0	0	0	0	0	0	3	1	0	4	1	0	3	1	4	1	0	0	0	1	1	9	10
05:00 PM	0	0	0	0	0	0	2	1	0	3	0	0	0	0	0	0	1	0	0	1	0	4	4
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	1
Total	0	0	0	0	0	0	2	1	0	3	1	0	0	0	1	0	1	0	0	1	0	5	5
Grand Total	0	0	0	0	0	0	5	2	0	7	2	0	3	1	5	1	1	0	0	2	1	14	15
Apprch %	0	0	0			0	71.4	28.6			40	0	60			50	50	0					
Total %	0	0	0		0	0	35.7	14.3		50	14.3	0	21.4		35.7	7.1	7.1	0		14.3	6.7	93.3	

	I-15 Northbound On Ramp Southbound				Limonite Avenue Westbound				I-15 Northbound Off Ramp Northbound				Limonite Avenue 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 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	**2**	**1**	**3**	0	0	0	0	0	**1**	0	**1**	**4**
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	**1**	0	0	**1**	0	0	0	0	1
Total Volume	0	0	0	0	0	2	1	3	1	0	0	1	0	1	0	1	5
% App. Total	0	0	0		0	66.7	33.3		100	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.250	.250	.250	.250	.000	.000	.250	.000	.250	.000	.250	.313

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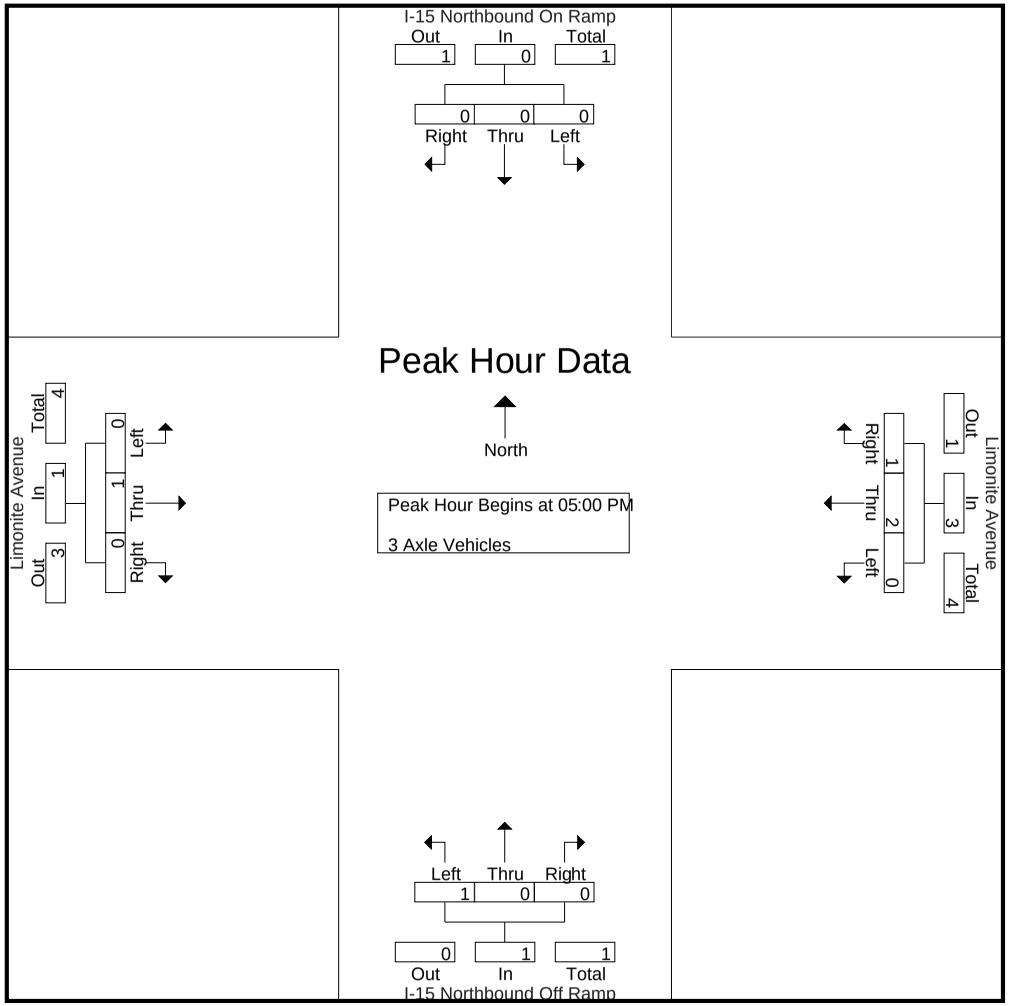
City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIPM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



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City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIPM
Site Code : 05114187
Start Date : 5/1/2014

	I-15 Northbound On Ramp Southbound				Limonite Avenue Westbound				I-15 Northbound Off Ramp Northbound				Limonite Avenue 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 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	05:00 PM				05:00 PM				05:00 PM				05:00 PM				
+0 mins.	0	0	0	0	0	**2**	**1**	**3**	0	0	0	0	0	**1**	0	**1**	
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
+45 mins.	0	0	0	0	0	0	0	0	**1**	0	0	**1**	0	0	0	0	
Total Volume	0	0	0	0	0	2	1	3	1	0	0	1	0	1	0	1	
% App. Total	0	0	0		0	66.7	33.3		100	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.250	.250	.250	.250	.000	.000	.250	.000	.250	.000	.250	

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City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIPM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- 4+ Axle Trucks

	I-15 Northbound On Ramp Southbound					Limonite Avenue Westbound					I-15 Northbound Off Ramp Northbound					Limonite Avenue Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	4	2	4	0	0	0	0	0	2	4	6
04:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	1	1	1	1	1	0	0	2	1	4	5
04:30 PM	0	0	0	0	0	0	1	2	0	3	0	0	1	1	1	1	1	0	0	2	1	6	7
04:45 PM	0	0	0	0	0	0	1	2	0	3	1	0	0	0	1	1	0	0	0	1	0	5	5
Total	0	0	0	0	0	0	3	4	0	7	1	0	6	4	7	3	2	0	0	5	4	19	23
05:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	1
05:15 PM	0	0	0	0	0	0	0	1	1	1	1	0	0	0	1	0	0	0	0	0	1	2	3
05:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	2	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	3	0	3	3
Total	0	0	0	0	0	0	0	1	1	1	4	0	0	0	4	2	1	0	0	3	1	8	9
Grand Total	0	0	0	0	0	0	3	5	1	8	5	0	6	4	11	5	3	0	0	8	5	27	32
Apprch %	0	0	0			0	37.5	62.5			45.5	0	54.5			62.5	37.5	0					
Total %	0	0	0		0	0	11.1	18.5		29.6	18.5	0	22.2		40.7	18.5	11.1	0		29.6	15.6	84.4	

	I-15 Northbound On Ramp Southbound				Limonite Avenue Westbound				I-15 Northbound Off Ramp Northbound				Limonite Avenue 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 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	**1**	**1**	1	0	0	1	0	0	0	0	2
05:30 PM	0	0	0	0	0	0	0	0	**2**	0	0	**2**	0	0	0	0	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**1**	0	**3**	**3**
Total Volume	0	0	0	0	0	0	1	1	4	0	0	4	2	1	0	3	8
% App. Total	0	0	0		0	0	100		100	0	0		66.7	33.3	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.250	.500	.000	.000	.500	.250	.250	.000	.250	.667

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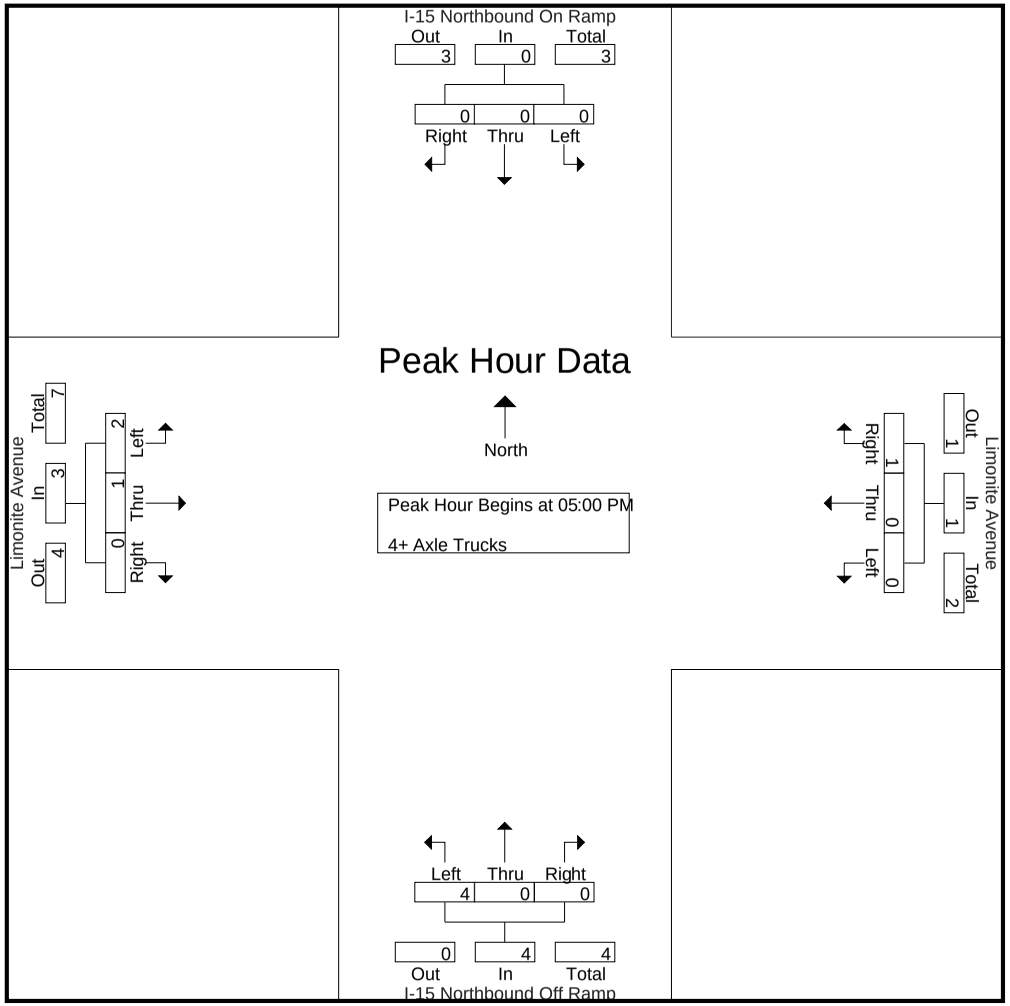
City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIPM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



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City of Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue
Weather: Clear

File Name : JVY15NLIPM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 3

	I-15 Northbound On Ramp Southbound				Limonite Avenue Westbound				I-15 Northbound Off Ramp Northbound				Limonite Avenue 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 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	05:00 PM				05:00 PM				05:00 PM				05:00 PM				
+0 mins.	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	
+15 mins.	0	0	0	0	0	0	**1**	**1**	1	0	0	1	0	0	0	0	
+30 mins.	0	0	0	0	0	0	0	0	**2**	0	0	**2**	0	0	0	0	
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	**2**	**1**	0	**3**	
Total Volume	0	0	0	0	0	0	1	1	4	0	0	4	2	1	0	3	
% App. Total	0	0	0		0	0	100		100	0	0		66.7	33.3	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.250	.500	.000	.000	.500	.250	.250	.000	.250	

Location: Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue

Date: 5/1/2014
Weather: Clear

WEEKDAY

	North Leg I-15 Northbound Ramps	East Leg Limonite Avenue	South Leg I-15 Northbound Ramps	West Leg Limonite Avenue	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	1	0	0	0	1
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	1	0	0	0	1
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	2	0	0	0	2

	North Leg I-15 Northbound Ramps	East Leg Limonite Avenue	South Leg I-15 Northbound Ramps	West Leg Limonite Avenue	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
1:00 PM	0	0	0	0	0
1:15 PM	0	0	0	0	0
1:30 PM	0	0	0	0	0
1:45 PM	0	0	0	0	0
2:00 PM	0	0	0	0	0
2:15 PM	0	0	0	0	0
2:30 PM	0	0	0	0	0
2:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

	North Leg I-15 Northbound Ramps	East Leg Limonite Avenue	South Leg I-15 Northbound Ramps	West Leg Limonite Avenue	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

Location: Jurupa Valley
N/S: I-15 Northbound Ramps
E/W: Limonite Avenue

Date: 5/1/2014
Weather: Clear

WEEKDAY

	North Leg I-15 Northbound Ramps	East Leg Limonite Avenue	South Leg I-15 Northbound Ramps	West Leg Limonite Avenue	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
7:00 AM	1	0	0	0	1
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	1	0	0	0	1

	North Leg I-15 Northbound Ramps	East Leg Limonite Avenue	South Leg I-15 Northbound Ramps	West Leg Limonite Avenue	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
1:00 PM	0	0	0	0	0
1:15 PM	0	0	0	0	0
1:30 PM	0	0	0	0	0
1:45 PM	0	0	0	0	0
2:00 PM	0	0	0	0	0
2:15 PM	0	0	0	0	0
2:30 PM	0	0	0	0	0
2:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

	North Leg I-15 Northbound Ramps	East Leg Limonite Avenue	South Leg I-15 Northbound Ramps	West Leg Limonite Avenue	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

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City of Jurupa Valley
N/S: Pats Ranch Road
E/W: Limonite Avenue
Weather: Clear

File Name : JVYPRLIAM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- Total Volume

	Limonite Avenue Westbound				Pats Ranch Road Northbound				Limonite Avenue Eastbound						
Start Time	Left	Thru	RTOR	App. Total	Left	Right	RTOR	App. Total	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	22	228	0	250	79	4	0	83	104	23	15	127	15	460	475
07:15 AM	21	238	0	259	85	17	12	102	117	23	11	140	23	501	524
07:30 AM	5	233	0	238	104	13	11	117	156	20	11	176	22	531	553
07:45 AM	7	201	0	208	60	15	12	75	157	24	5	181	17	464	481
Total	55	900	0	955	328	49	35	377	534	90	42	624	77	1956	2033
08:00 AM	14	184	0	198	48	10	8	58	136	20	2	156	10	412	422
08:15 AM	25	216	0	241	64	9	7	73	119	17	3	136	10	450	460
08:30 AM	19	202	0	221	71	19	13	90	144	26	5	170	18	481	499
08:45 AM	21	190	0	211	44	17	13	61	148	23	6	171	19	443	462
Total	79	792	0	871	227	55	41	282	547	86	16	633	57	1786	1843
Grand Total	134	1692	0	1826	555	104	76	659	1081	176	58	1257	134	3742	3876
Apprch %	7.3	92.7			84.2	15.8			86	14					
Total %	3.6	45.2		48.8	14.8	2.8		17.6	28.9	4.7		33.6	3.5	96.5	

	Limonite Avenue Westbound			Pats Ranch Road Northbound			Limonite Avenue Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	**22**	228	250	79	4	83	104	23	127	460
07:15 AM	21	**238**	**259**	85	**17**	102	117	23	140	501
07:30 AM	5	233	238	**104**	13	**117**	156	20	176	**531**
07:45 AM	7	201	208	60	15	75	**157**	**24**	**181**	464
Total Volume	55	900	955	328	49	377	534	90	624	1956
% App. Total	5.8	94.2		87	13		85.6	14.4		
PHF	.625	.945	.922	.788	.721	.806	.850	.938	.862	.921

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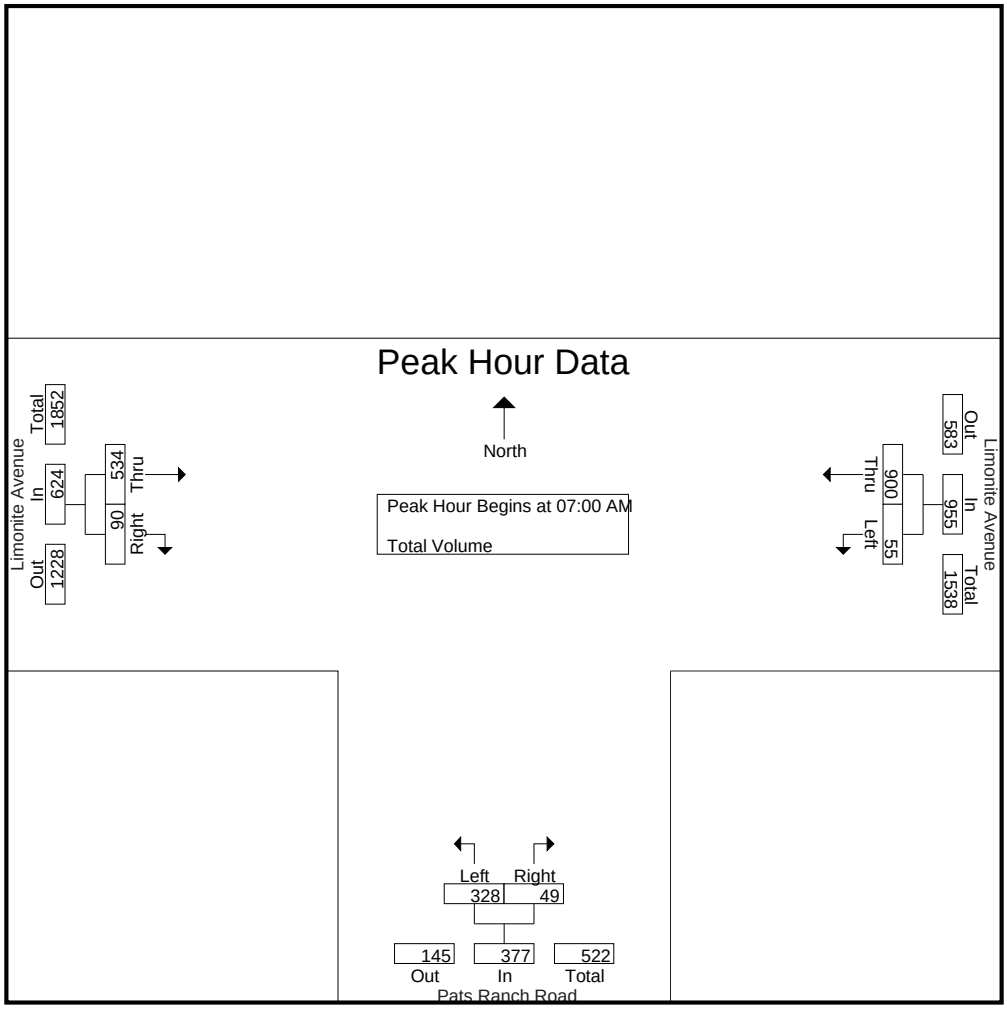
City of Jurupa Valley
N/S: Pats Ranch Road
E/W: Limonite Avenue
Weather: Clear

File Name : JVYPRLIAM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:15 AM		
+0 mins.	**22**	228	250	79	4	83	117	23	140
+15 mins.	21	**238**	**259**	85	**17**	102	156	20	176
+30 mins.	5	233	238	**104**	13	**117**	**157**	**24**	**181**
+45 mins.	7	201	208	60	15	75	136	20	156
Total Volume	55	900	955	328	49	377	566	87	653
% App. Total	5.8	94.2		87	13		86.7	13.3	
PHF	.625	.945	.922	.788	.721	.806	.901	.906	.902

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City of Jurupa Valley
N/S: Pats Ranch Road
E/W: Limonite Avenue
Weather: Clear

File Name : JVYPRLIPM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- Total Volume

	Limonite Avenue Westbound				Pats Ranch Road Northbound				Limonite Avenue Eastbound						
Start Time	Left	Thru	RTOR	App. Total	Left	Right	RTOR	App. Total	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	38	169	0	207	72	21	0	93	248	30	9	278	9	578	587
04:15 PM	38	210	0	248	74	29	19	103	259	43	16	302	35	653	688
04:30 PM	30	165	0	195	73	36	27	109	239	46	21	285	48	589	637
04:45 PM	31	207	0	238	63	31	16	94	246	48	18	294	34	626	660
Total	137	751	0	888	282	117	62	399	992	167	64	1159	126	2446	2572
05:00 PM	44	176	0	220	104	34	15	138	258	70	20	328	35	686	721
05:15 PM	43	190	0	233	70	23	16	93	244	49	23	293	39	619	658
05:30 PM	41	207	0	248	65	23	17	88	239	62	26	301	43	637	680
05:45 PM	52	190	0	242	70	33	21	103	217	64	22	281	43	626	669
Total	180	763	0	943	309	113	69	422	958	245	91	1203	160	2568	2728
Grand Total	317	1514	0	1831	591	230	131	821	1950	412	155	2362	286	5014	5300
Apprch %	17.3	82.7			72	28			82.6	17.4					
Total %	6.3	30.2		36.5	11.8	4.6		16.4	38.9	8.2		47.1	5.4	94.6	

	Limonite Avenue Westbound			Pats Ranch Road Northbound			Limonite Avenue Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	31	**207**	238	63	31	94	246	48	294	626
05:00 PM	**44**	176	220	**104**	**34**	**138**	**258**	**70**	**328**	**686**
05:15 PM	43	190	233	70	23	93	244	49	293	619
05:30 PM	41	207	**248**	65	23	88	239	62	301	637
Total Volume	159	780	939	302	111	413	987	229	1216	2568
% App. Total	16.9	83.1		73.1	26.9		81.2	18.8		
PHF	.903	.942	.947	.726	.816	.748	.956	.818	.927	.936

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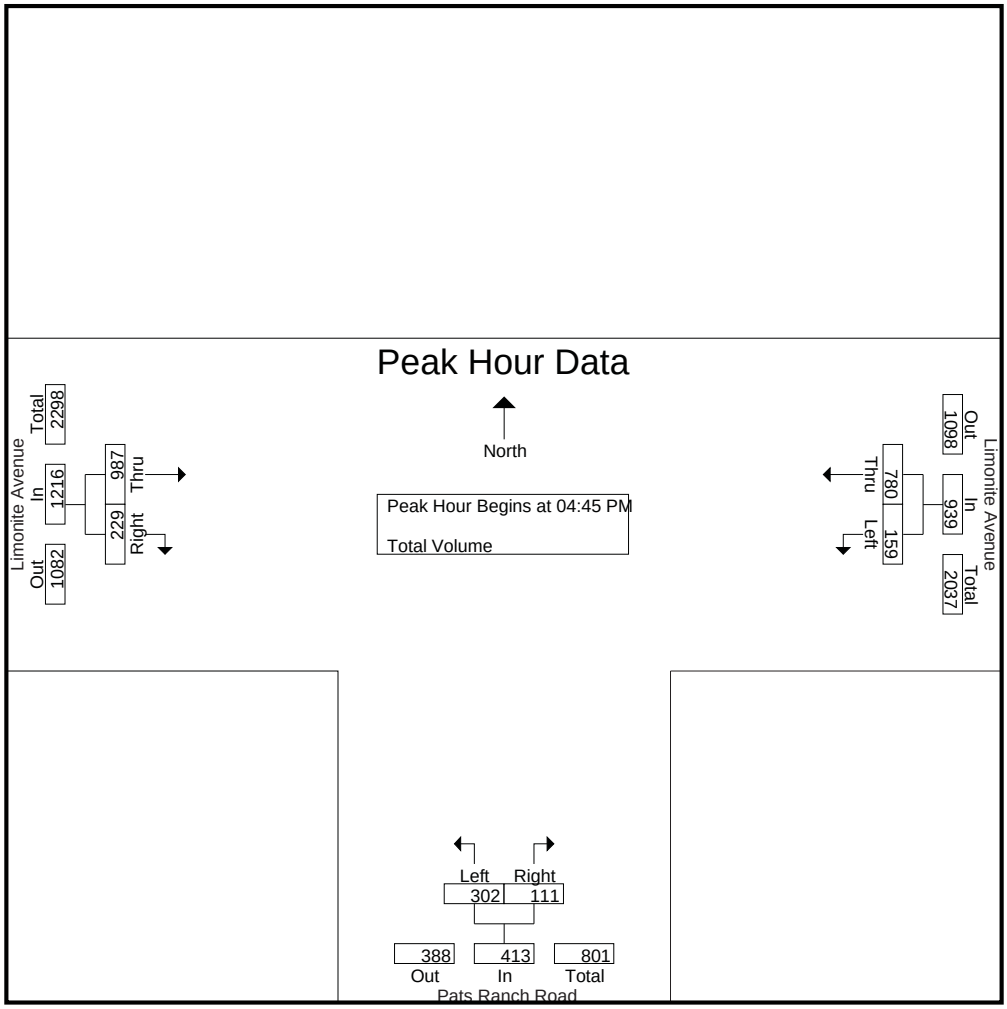
City of Jurupa Valley
N/S: Pats Ranch Road
E/W: Limonite Avenue
Weather: Clear

File Name : JVYPRLIPM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM			04:15 PM			04:45 PM		
+0 mins.	44	176	220	74	29	103	246	48	294
+15 mins.	43	190	233	73	**36**	109	**258**	**70**	**328**
+30 mins.	41	**207**	**248**	63	31	94	244	49	293
+45 mins.	**52**	190	242	**104**	34	**138**	239	62	301
Total Volume	180	763	943	314	130	444	987	229	1216
% App. Total	19.1	80.9		70.7	29.3		81.2	18.8	
PHF	.865	.921	.951	.755	.903	.804	.956	.818	.927

Location: Jurupa Valley
N/S: Pats Ranch Road
E/W: Limonite Avenue

Date: 5/1/2014
Weather: Clear

WEEKDAY

	North Leg Pats Ranch Road	East Leg Limonite Avenue	South Leg Pats Ranch Road	West Leg Limonite Avenue	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
7:00 AM	1	0	0	0	1
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	1	0	0	0	1

	North Leg Pats Ranch Road	East Leg Limonite Avenue	South Leg Pats Ranch Road	West Leg Limonite Avenue	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
1:00 PM	0	0	0	0	0
1:15 PM	0	0	0	0	0
1:30 PM	0	0	0	0	0
1:45 PM	0	0	0	0	0
2:00 PM	0	0	0	0	0
2:15 PM	0	0	0	0	0
2:30 PM	0	0	0	0	0
2:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

	North Leg Pats Ranch Road	East Leg Limonite Avenue	South Leg Pats Ranch Road	West Leg Limonite Avenue	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

Location: Jurupa Valley
N/S: Pats Ranch Road
E/W: Limonite Avenue

Date: 5/1/2014
Weather: Clear

WEEKDAY

	North Leg Pats Ranch Road	East Leg Limonite Avenue	South Leg Pats Ranch Road	West Leg Limonite Avenue	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

	North Leg Pats Ranch Road	East Leg Limonite Avenue	South Leg Pats Ranch Road	West Leg Limonite Avenue	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
1:00 PM	0	0	0	0	0
1:15 PM	0	0	0	0	0
1:30 PM	0	0	0	0	0
1:45 PM	0	0	0	0	0
2:00 PM	0	0	0	0	0
2:15 PM	0	0	2	0	2
2:30 PM	0	0	1	0	1
2:45 PM	0	0	1	0	1
TOTAL VOLUMES:	0	0	4	0	4

	North Leg Pats Ranch Road	East Leg Limonite Avenue	South Leg Pats Ranch Road	West Leg Limonite Avenue	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

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City of Jurupa Valley
N/S: Pats Ranch Road
E/W: 65th Street
Weather: Clear

File Name : JVYPR65AM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- Total Volume

	Pats Ranch Road Southbound					65th Street Westbound					Pats Ranch Road Northbound					Shopping Center Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	3	35	0	0	38	5	0	12	8	17	7	51	2	0	60	8	1	5	4	14	12	129	141
07:15 AM	2	41	0	0	43	19	3	11	7	33	7	57	7	1	71	3	1	4	2	8	10	155	165
07:30 AM	1	30	0	0	31	8	1	5	4	14	12	90	14	1	116	4	0	7	7	11	12	172	184
07:45 AM	1	11	0	0	12	9	2	5	5	16	18	48	7	1	73	4	3	3	3	10	9	111	120
Total	7	117	0	0	124	41	6	33	24	80	44	246	30	3	320	19	5	19	16	43	43	567	610
08:00 AM	4	26	3	0	33	5	0	5	4	10	19	38	6	0	63	4	1	1	1	6	5	112	117
08:15 AM	3	34	0	0	37	9	2	10	6	21	10	29	2	0	41	8	1	5	5	14	11	113	124
08:30 AM	2	21	1	0	24	1	0	7	6	8	11	41	6	1	58	2	1	6	4	9	11	99	110
08:45 AM	1	25	2	0	28	4	1	5	4	10	15	41	3	1	59	6	2	5	5	13	10	110	120
Total	10	106	6	0	122	19	3	27	20	49	55	149	17	2	221	20	5	17	15	42	37	434	471
Grand Total	17	223	6	0	246	60	9	60	44	129	99	395	47	5	541	39	10	36	31	85	80	1001	1081
Apprch %	6.9	90.7	2.4			46.5	7	46.5			18.3	73	8.7			45.9	11.8	42.4					
Total %	1.7	22.3	0.6		24.6	6	0.9	6		12.9	9.9	39.5	4.7		54	3.9	1	3.6		8.5	7.4	92.6	

	Pats Ranch Road Southbound				65th Street Westbound				Pats Ranch Road Northbound				Shopping Center 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 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**3**	35	0	38	5	0	**12**	17	7	51	2	60	**8**	1	5	**14**	129
07:15 AM	2	**41**	0	**43**	**19**	**3**	11	**33**	7	57	7	71	3	1	4	8	155
07:30 AM	1	30	0	31	8	1	5	14	12	**90**	**14**	**116**	4	0	**7**	11	**172**
07:45 AM	1	11	0	12	9	2	5	16	**18**	48	7	73	4	**3**	3	10	111
Total Volume	7	117	0	124	41	6	33	80	44	246	30	320	19	5	19	43	567
% App. Total	5.6	94.4	0		51.2	7.5	41.2		13.8	76.9	9.4		44.2	11.6	44.2		
PHF	.583	.713	.000	.721	.539	.500	.688	.606	.611	.683	.536	.690	.594	.417	.679	.768	.824

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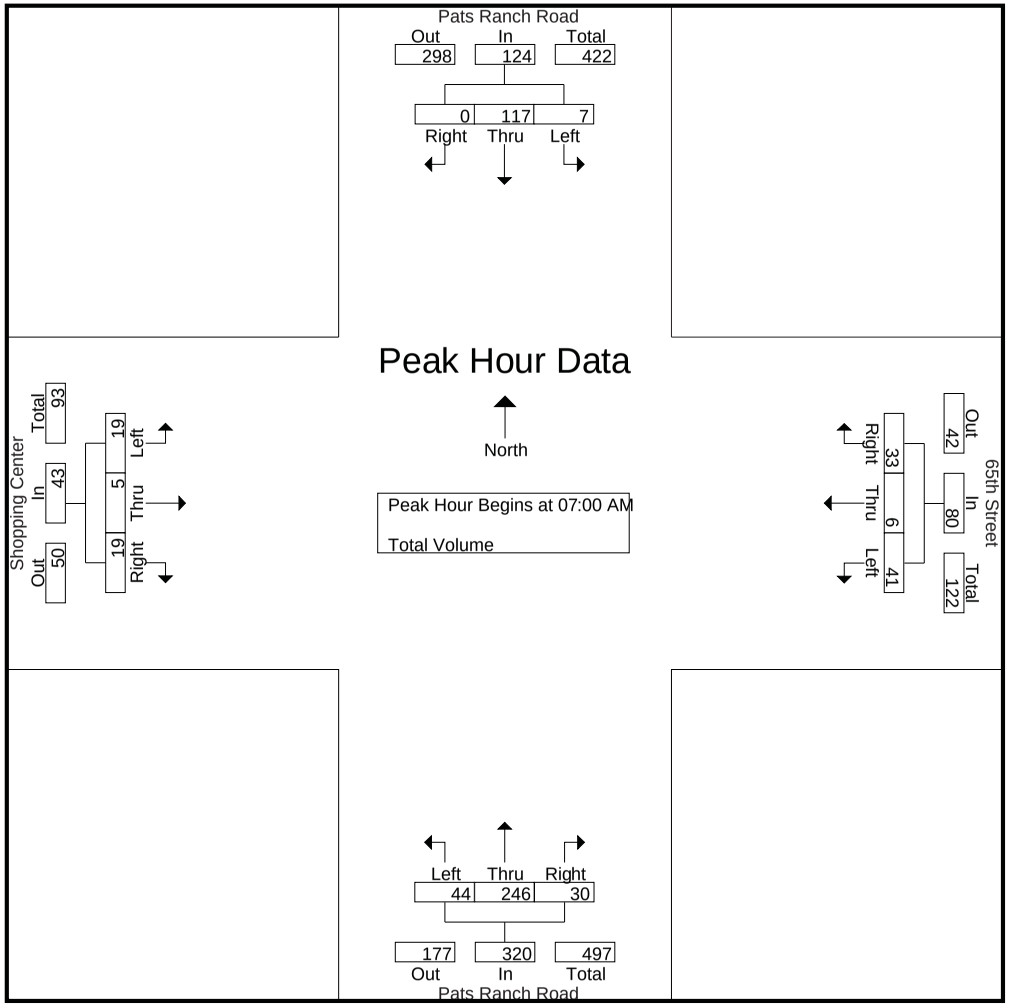
City of Jurupa Valley
N/S: Pats Ranch Road
E/W: 65th Street
Weather: Clear

File Name : JVYPR65AM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



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City of Jurupa Valley
N/S: Pats Ranch Road
E/W: 65th Street
Weather: Clear

File Name : JVYPR65AM
Site Code : 05114187
Start Date : 5/1/2014

	Pats Ranch Road Southbound				65th Street Westbound				Pats Ranch Road Northbound				Shopping Center 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 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	07:00 AM				07:00 AM				07:15 AM				07:00 AM				
+0 mins.	**3**	35	0	38	5	0	**12**	17	7	57	7	71	**8**	1	5	**14**	
+15 mins.	2	**41**	0	**43**	**19**	**3**	11	**33**	12	**90**	**14**	**116**	3	1	4	8	
+30 mins.	1	30	0	31	8	1	5	14	18	48	7	73	4	0	**7**	11	
+45 mins.	1	11	0	12	9	2	5	16	**19**	38	6	63	4	**3**	3	10	
Total Volume	7	117	0	124	41	6	33	80	56	233	34	323	19	5	19	43	
% App. Total	5.6	94.4	0		51.2	7.5	41.2		17.3	72.1	10.5		44.2	11.6	44.2		
PHF	.583	.713	.000	.721	.539	.500	.688	.606	.737	.647	.607	.696	.594	.417	.679	.768	

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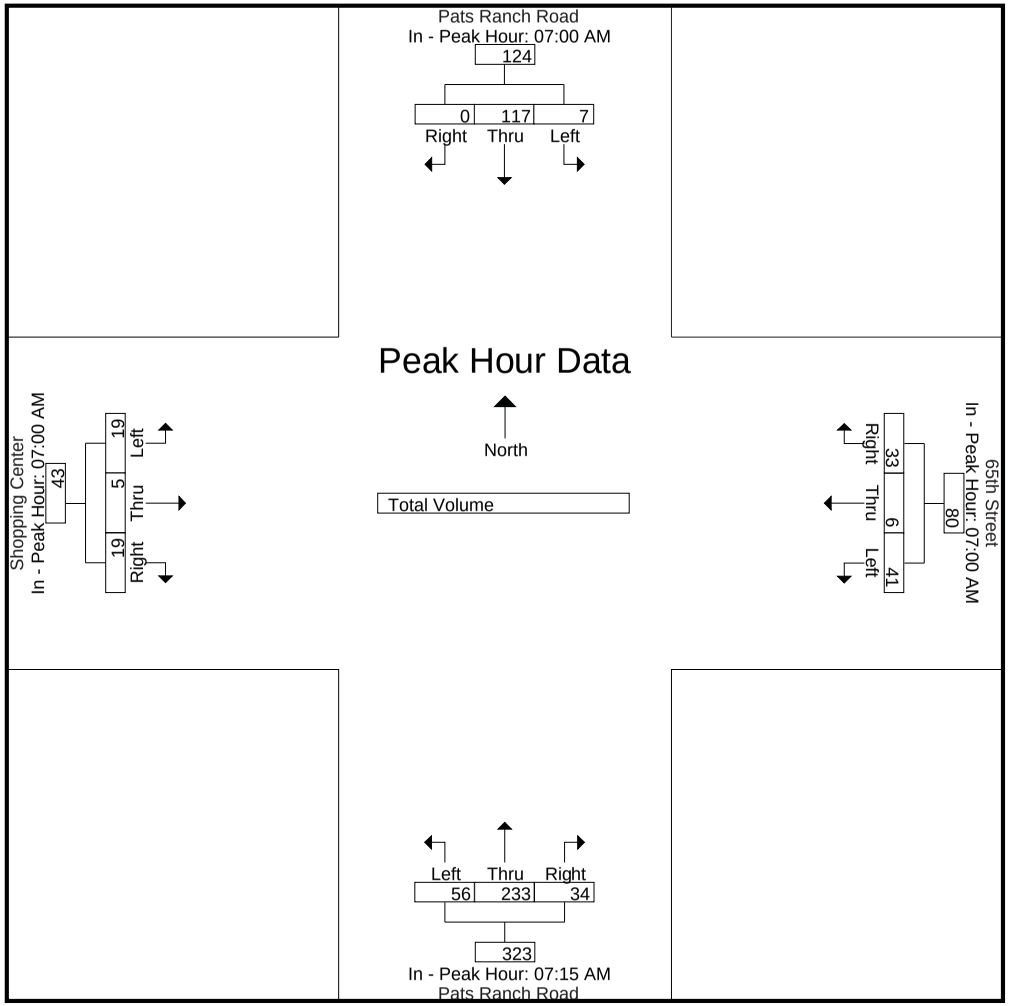
City of Jurupa Valley
N/S: Pats Ranch Road
E/W: 65th Street
Weather: Clear

File Name : JVYPR65AM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 4



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City of Jurupa Valley
N/S: Pats Ranch Road
E/W: 65th Street
Weather: Clear

File Name : JVYPR65MD
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- Total Volume

	Pats Ranch Road Southbound					65th Street Westbound					Pats Ranch Road Northbound					Shopping Center Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
01:00 PM	8	30	1	0	39	1	1	2	2	4	14	17	3	1	34	8	1	4	3	13	6	90	96
01:15 PM	6	36	2	0	44	2	0	5	4	7	11	26	4	0	41	7	0	4	3	11	7	103	110
01:30 PM	6	41	2	0	49	3	6	4	4	13	9	27	3	1	39	7	0	2	1	9	6	110	116
01:45 PM	10	52	1	0	63	2	2	2	2	6	8	20	2	0	30	3	1	6	3	10	5	109	114
Total	30	159	6	0	195	8	9	13	12	30	42	90	12	2	144	25	2	16	10	43	24	412	436
02:00 PM	9	51	0	0	60	2	1	3	3	6	14	25	2	0	41	7	2	8	6	17	9	124	133
02:15 PM	7	42	3	0	52	3	2	10	7	15	16	90	12	0	118	2	0	3	2	5	9	190	199
02:30 PM	8	39	1	0	48	8	2	5	5	15	12	35	4	0	51	4	0	10	8	14	13	128	141
02:45 PM	10	50	1	0	61	5	2	3	3	10	8	34	5	0	47	9	0	3	2	12	5	130	135
Total	34	182	5	0	221	18	7	21	18	46	50	184	23	0	257	22	2	24	18	48	36	572	608
Grand Total	64	341	11	0	416	26	16	34	30	76	92	274	35	2	401	47	4	40	28	91	60	984	1044
Apprch %	15.4	82	2.6			34.2	21.1	44.7			22.9	68.3	8.7			51.6	4.4	44					
Total %	6.5	34.7	1.1		42.3	2.6	1.6	3.5		7.7	9.3	27.8	3.6		40.8	4.8	0.4	4.1		9.2	5.7	94.3	

	Pats Ranch Road Southbound				65th Street Westbound				Pats Ranch Road Northbound				Shopping Center 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 01:00 PM to 02:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:00 PM																	
02:00 PM	9	**51**	0	60	2	1	3	6	14	25	2	41	7	**2**	8	**17**	124
02:15 PM	7	42	**3**	52	3	**2**	**10**	**15**	**16**	**90**	**12**	**118**	2	0	3	5	**190**
02:30 PM	8	39	1	48	**8**	2	5	15	12	35	4	51	4	0	**10**	14	128
02:45 PM	**10**	50	1	**61**	5	2	3	10	8	34	5	47	**9**	0	3	12	130
Total Volume	34	182	5	221	18	7	21	46	50	184	23	257	22	2	24	48	572
% App. Total	15.4	82.4	2.3		39.1	15.2	45.7		19.5	71.6	8.9		45.8	4.2	50		
PHF	.850	.892	.417	.906	.563	.875	.525	.767	.781	.511	.479	.544	.611	.250	.600	.706	.753

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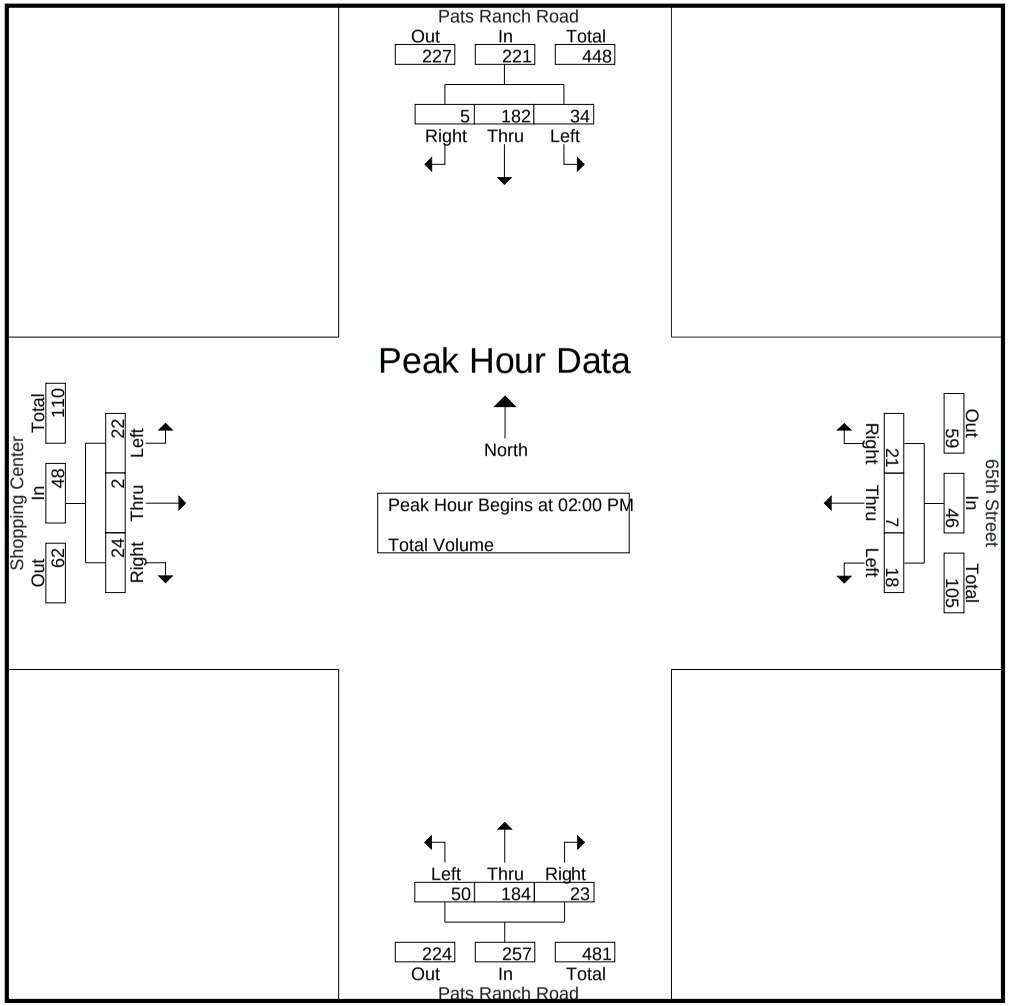
City of Jurupa Valley
N/S: Pats Ranch Road
E/W: 65th Street
Weather: Clear

File Name : JVYPR65MD
Site Code : 05114187
Start Date : 5/1/2014
Page No : 2



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	Pats Ranch Road Southbound				65th Street Westbound				Pats Ranch Road Northbound				Shopping Center 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 01:00 PM to 02:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	01:30 PM				02:00 PM				02:00 PM				02:00 PM				
+0 mins.	6	41	2	49	2	1	3	6	14	25	2	41	7	**2**	8	**17**	
+15 mins.	**10**	**52**	1	**63**	3	**2**	**10**	**15**	**16**	**90**	**12**	**118**	2	0	3	5	
+30 mins.	9	51	0	60	**8**	2	5	15	12	35	4	51	4	0	**10**	14	
+45 mins.	7	42	**3**	52	5	2	3	10	8	34	5	47	**9**	0	3	12	
Total Volume	32	186	6	224	18	7	21	46	50	184	23	257	22	2	24	48	
% App. Total	14.3	83	2.7		39.1	15.2	45.7		19.5	71.6	8.9		45.8	4.2	50		
PHF	.800	.894	.500	.889	.563	.875	.525	.767	.781	.511	.479	.544	.611	.250	.600	.706	

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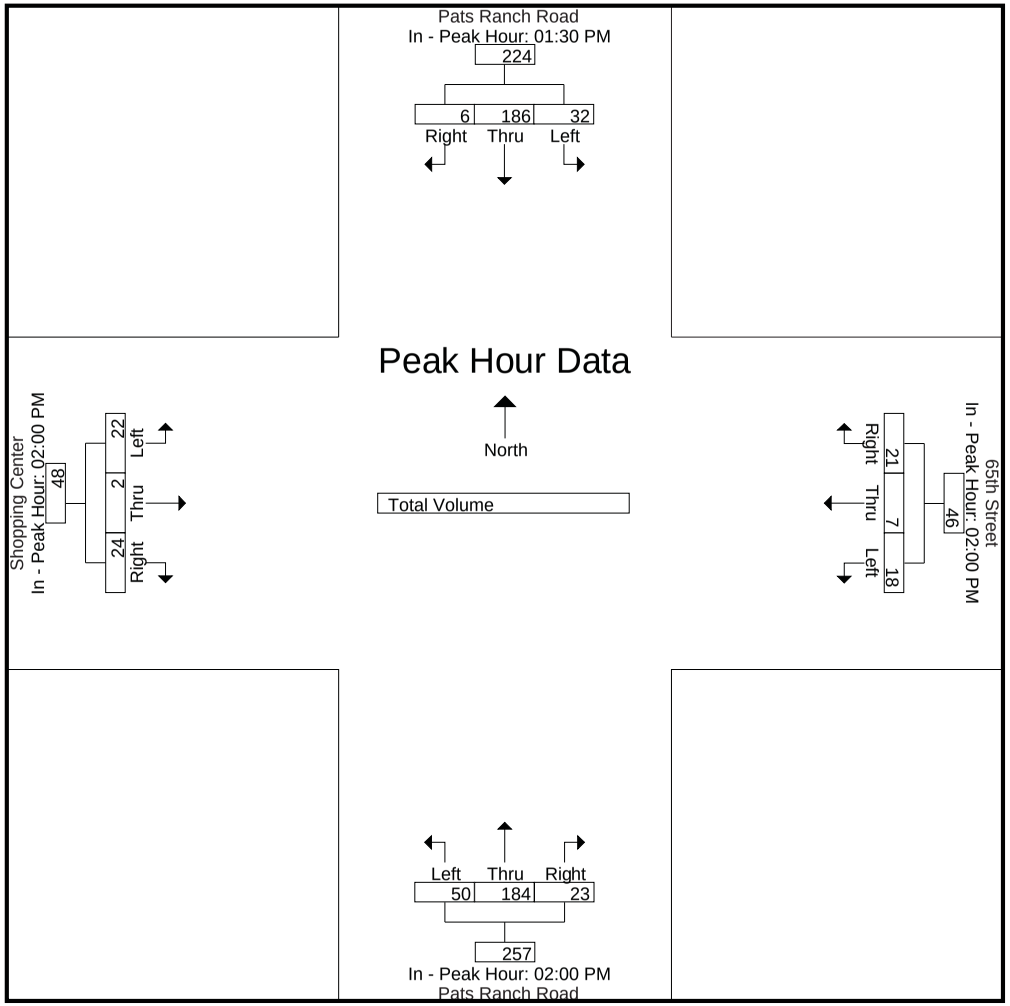

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Groups Printed- Total Volume

	Pats Ranch Road Southbound					65th Street Westbound					Pats Ranch Road Northbound					Shopping Center Eastbound							
Start Time	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Left	Thru	Right	RTOR	App. Total	Exclu. Total	Inclu. Total	Int. Total
04:00 PM	11	41	2	0	54	4	2	1	1	7	17	29	2	0	48	9	1	8	7	18	8	127	135
04:15 PM	6	38	1	0	45	4	1	2	2	7	17	24	7	0	48	3	0	7	3	10	5	110	115
04:30 PM	8	42	1	0	51	2	3	1	0	6	12	32	1	0	45	9	1	7	3	17	3	119	122
04:45 PM	6	52	0	0	58	3	7	5	5	15	16	35	6	1	57	5	0	4	4	9	10	139	149
Total	31	173	4	0	208	13	13	9	8	35	62	120	16	1	198	26	2	26	17	54	26	495	521
05:00 PM	16	56	0	0	72	4	2	5	3	11	14	29	3	0	46	13	1	10	8	24	11	153	164
05:15 PM	11	47	3	0	61	1	8	7	6	16	20	19	3	0	42	7	3	2	0	12	6	131	137
05:30 PM	8	75	0	0	83	1	5	4	3	10	24	31	1	0	56	4	2	7	4	13	7	162	169
05:45 PM	16	72	5	0	93	1	7	3	2	11	23	35	3	0	61	10	0	8	3	18	5	183	188
Total	51	250	8	0	309	7	22	19	14	48	81	114	10	0	205	34	6	27	15	67	29	629	658
Grand Total	82	423	12	0	517	20	35	28	22	83	143	234	26	1	403	60	8	53	32	121	55	1124	1179
Apprch %	15.9	81.8	2.3			24.1	42.2	33.7			35.5	58.1	6.5			49.6	6.6	43.8					
Total %	7.3	37.6	1.1		46	1.8	3.1	2.5		7.4	12.7	20.8	2.3		35.9	5.3	0.7	4.7		10.8	4.7	95.3	

	Pats Ranch Road Southbound				65th Street Westbound				Pats Ranch Road Northbound				Shopping Center 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	**16**	56	0	72	**4**	2	5	11	14	29	**3**	46	**13**	1	**10**	**24**	153
05:15 PM	11	47	3	61	1	**8**	**7**	**16**	20	19	3	42	7	**3**	2	12	131
05:30 PM	8	**75**	0	83	1	5	4	10	**24**	31	1	56	4	2	7	13	162
05:45 PM	16	72	**5**	**93**	1	7	3	11	23	**35**	3	**61**	10	0	8	18	**183**
Total Volume	51	250	8	309	7	22	19	48	81	114	10	205	34	6	27	67	629
% App. Total	16.5	80.9	2.6		14.6	45.8	39.6		39.5	55.6	4.9		50.7	9	40.3		
PHF	.797	.833	.400	.831	.438	.688	.679	.750	.844	.814	.833	.840	.654	.500	.675	.698	.859

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File Name : JVYPR65PM
Site Code : 05114187
Start Date : 5/1/2014
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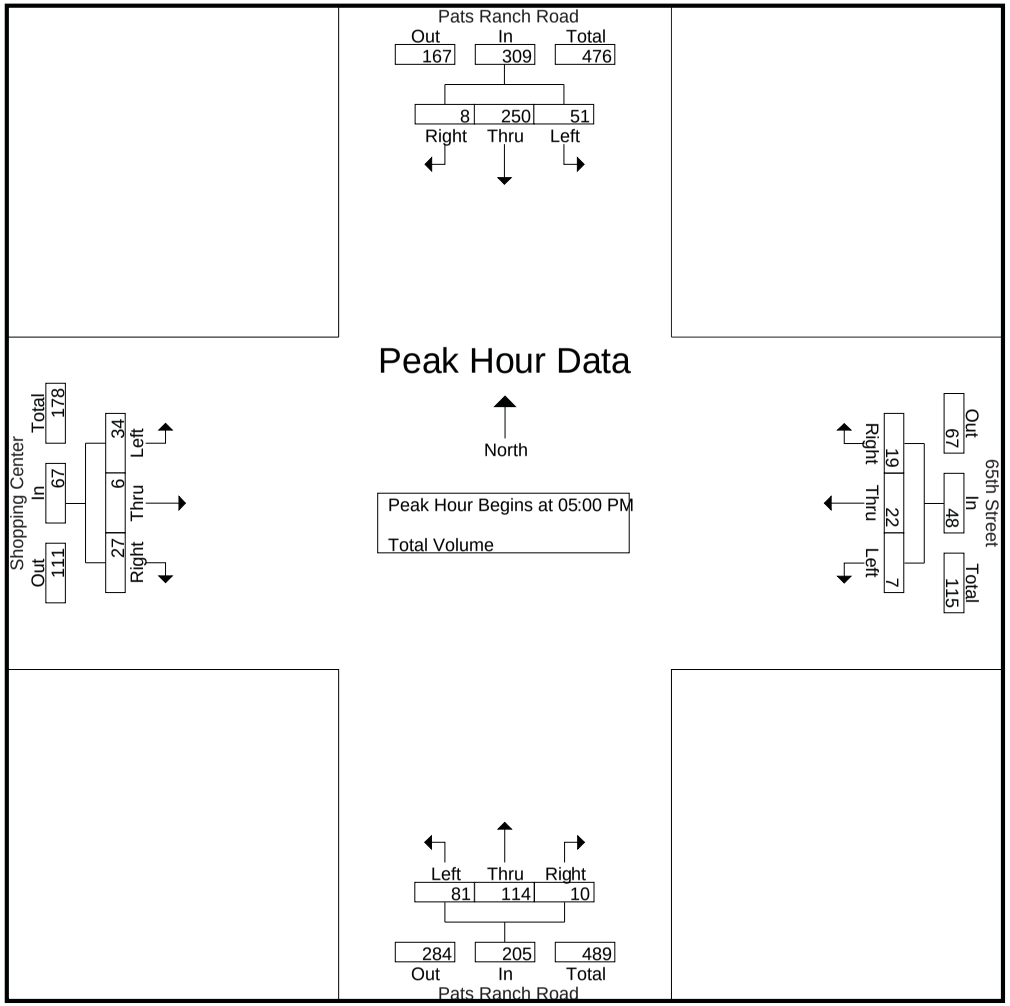

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N/S: Pats Ranch Road
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File Name : JVYPR65PM
Site Code : 05114187
Start Date : 5/1/2014

	Pats Ranch Road Southbound				65th Street Westbound				Pats Ranch Road Northbound				Shopping Center 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Each Approach Begins at:																	
	05:00 PM				04:45 PM				05:00 PM				05:00 PM				
+0 mins.	**16**	56	0	72	3	7	5	15	14	29	**3**	46	**13**	1	**10**	**24**	
+15 mins.	11	47	3	61	**4**	2	5	11	20	19	3	42	7	**3**	2	12	
+30 mins.	8	**75**	0	83	1	**8**	**7**	**16**	**24**	31	1	56	4	2	7	13	
+45 mins.	16	72	**5**	**93**	1	5	4	10	23	**35**	3	**61**	10	0	8	18	
Total Volume	51	250	8	309	9	22	21	52	81	114	10	205	34	6	27	67	
% App. Total	16.5	80.9	2.6		17.3	42.3	40.4		39.5	55.6	4.9		50.7	9	40.3		
PHF	.797	.833	.400	.831	.563	.688	.750	.813	.844	.814	.833	.840	.654	.500	.675	.698	

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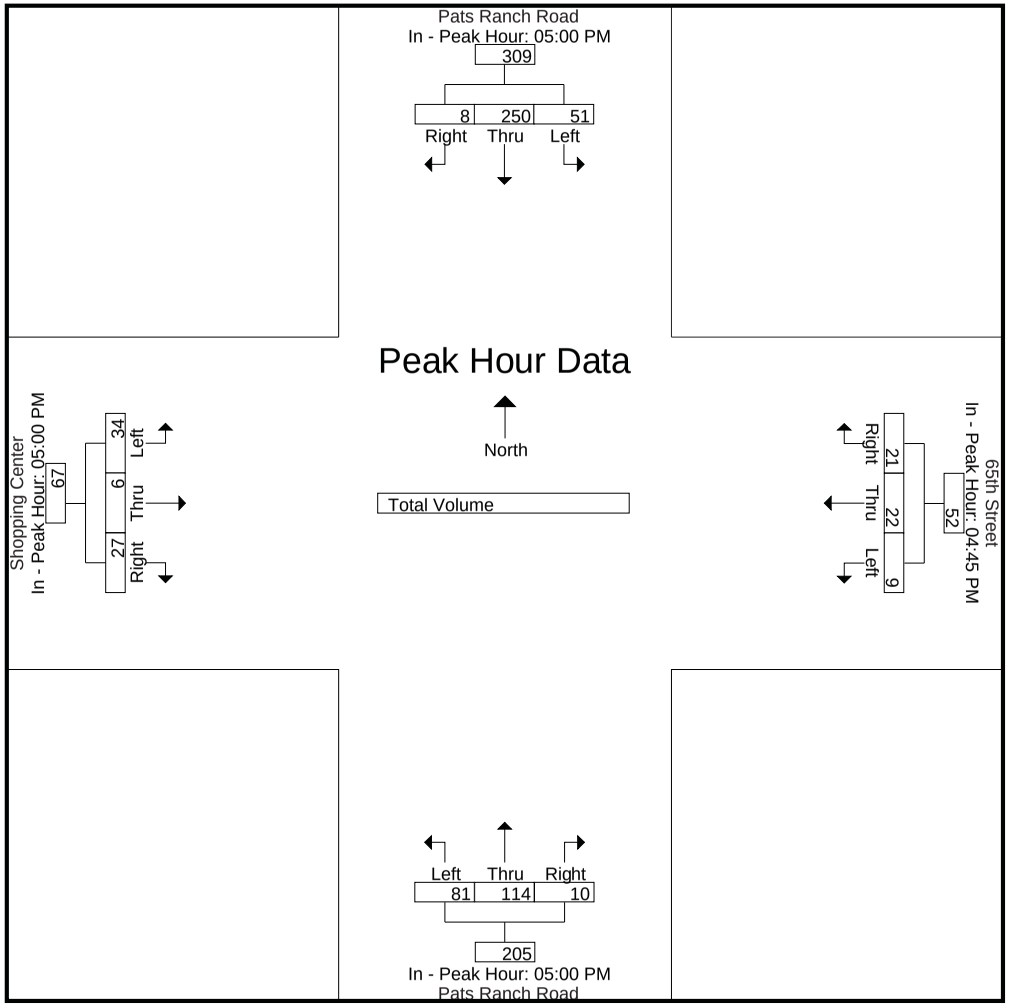

Location: Jurupa Valley
N/S: Pats Ranch Road
E/W: 65th Street

Date: 5/1/2014
Weather: Clear

WEEKDAY

	North Leg Pats Ranch Road	East Leg 65th Street	South Leg Pats Ranch Road	West Leg 65th Street	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
7:00 AM	0	4	0	1	5
7:15 AM	0	1	0	0	1
7:30 AM	0	1	0	0	1
7:45 AM	0	2	0	0	2
8:00 AM	0	0	0	0	0
8:15 AM	0	2	0	0	2
8:30 AM	2	0	0	2	4
8:45 AM	0	3	0	2	5
TOTAL VOLUMES:	2	13	0	5	20

	North Leg Pats Ranch Road	East Leg 65th Street	South Leg Pats Ranch Road	West Leg 65th Street	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
1:00 PM	0	1	0	0	1
1:15 PM	0	0	0	0	0
1:30 PM	0	1	0	0	1
1:45 PM	0	0	0	0	0
2:00 PM	0	0	0	0	0
2:15 PM	0	0	0	0	0
2:30 PM	0	0	0	0	0
2:45 PM	0	0	0	1	1
TOTAL VOLUMES:	0	2	0	1	3

	North Leg Pats Ranch Road	East Leg 65th Street	South Leg Pats Ranch Road	West Leg 65th Street	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
4:00 PM	0	1	0	0	1
4:15 PM	1	2	0	0	3
4:30 PM	0	0	0	0	0
4:45 PM	1	0	0	0	1
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	2	0	0	2
5:45 PM	2	0	0	0	2
TOTAL VOLUMES:	4	5	0	0	9

Location: Jurupa Valley
N/S: Pats Ranch Road
E/W: 65th Street

Date: 5/1/2014
Weather: Clear

WEEKDAY

	North Leg Pats Ranch Road	East Leg 65th Street	South Leg Pats Ranch Road	West Leg 65th Street	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
7:00 AM	0	1	0	0	1
7:15 AM	0	1	0	0	1
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	2	0	0	2

	North Leg Pats Ranch Road	East Leg 65th Street	South Leg Pats Ranch Road	West Leg 65th Street	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
1:00 PM	0	0	0	0	0
1:15 PM	0	0	0	0	0
1:30 PM	0	0	0	0	0
1:45 PM	0	0	0	0	0
2:00 PM	0	0	0	1	1
2:15 PM	0	1	0	0	1
2:30 PM	0	0	0	0	0
2:45 PM	0	1	0	0	1
TOTAL VOLUMES:	0	2	0	1	3

	North Leg Pats Ranch Road	East Leg 65th Street	South Leg Pats Ranch Road	West Leg 65th Street	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
4:00 PM	0	0	0	2	2
4:15 PM	0	1	0	0	1
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	1	0	2	3

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City of Jurupa Valley
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E/W: Ivory Street
Weather: Clear

File Name : JVYPRIVAM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- Total Volume

	Pats Ranch Road Southbound			Ivory Street Westbound			Pats Ranch Road Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	7	40	47	1	15	16	45	0	45	108
07:15 AM	10	54	64	27	24	51	48	20	68	183
07:30 AM	13	30	43	41	37	78	75	27	102	223
07:45 AM	3	22	25	2	7	9	60	0	60	94
Total	33	146	179	71	83	154	228	47	275	608
08:00 AM	3	29	32	2	6	8	55	0	55	95
08:15 AM	4	45	49	4	2	6	41	2	43	98
08:30 AM	2	28	30	0	6	6	56	1	57	93
08:45 AM	5	31	36	0	5	5	50	1	51	92
Total	14	133	147	6	19	25	202	4	206	378
Grand Total	47	279	326	77	102	179	430	51	481	986
Apprch %	14.4	85.6		43	57		89.4	10.6		
Total %	4.8	28.3	33.1	7.8	10.3	18.2	43.6	5.2	48.8	

	Pats Ranch Road Southbound			Ivory Street Westbound			Pats Ranch Road Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	7	40	47	1	15	16	45	0	45	108
07:15 AM	10	**54**	**64**	27	24	51	48	20	68	183
07:30 AM	**13**	30	43	**41**	**37**	**78**	**75**	**27**	**102**	**223**
07:45 AM	3	22	25	2	7	9	60	0	60	94
Total Volume	33	146	179	71	83	154	228	47	275	608
% App. Total	18.4	81.6		46.1	53.9		82.9	17.1		
PHF	.635	.676	.699	.433	.561	.494	.760	.435	.674	.682

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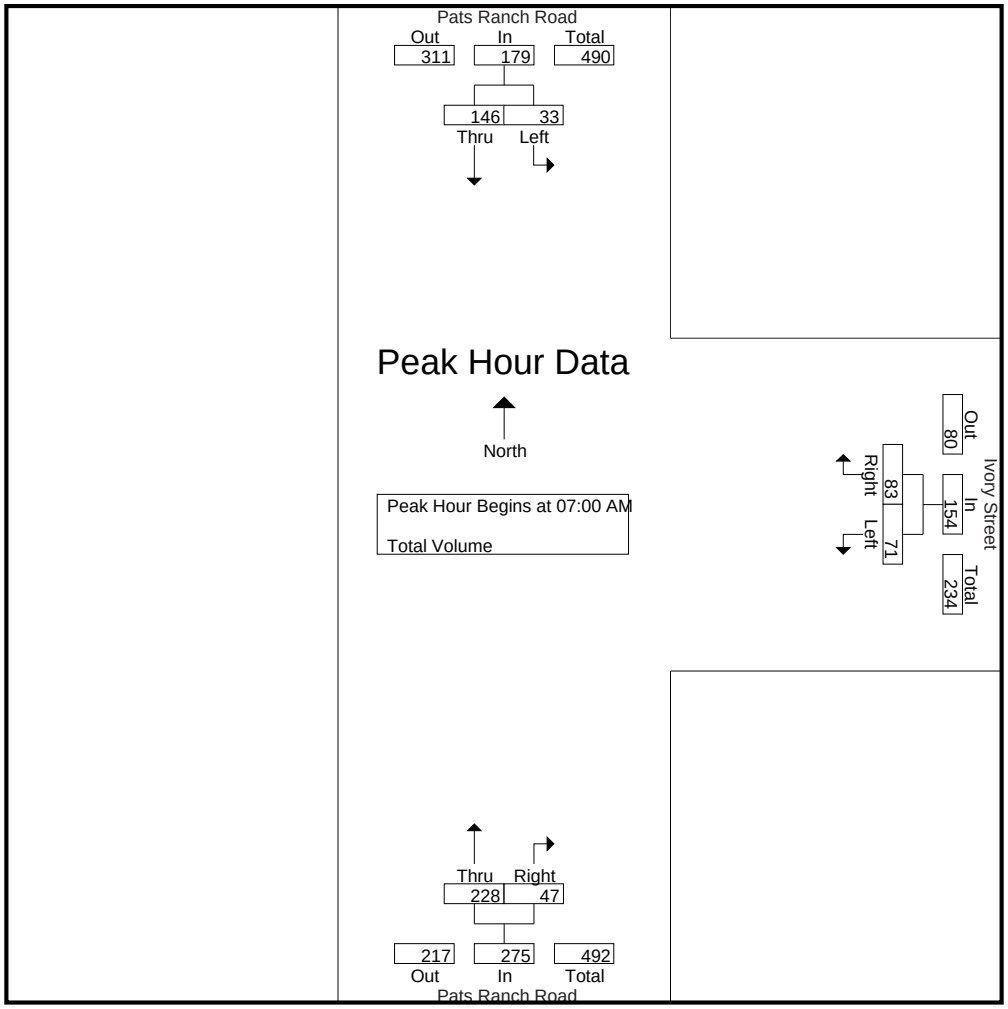

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:15 AM		
+0 mins.	7	40	47	1	15	16	48	20	68
+15 mins.	10	**54**	**64**	27	24	51	**75**	**27**	**102**
+30 mins.	**13**	30	43	**41**	**37**	**78**	60	0	60
+45 mins.	3	22	25	2	7	9	55	0	55
Total Volume	33	146	179	71	83	154	238	47	285
% App. Total	18.4	81.6		46.1	53.9		83.5	16.5	
PHF	.635	.676	.699	.433	.561	.494	.793	.435	.699

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Groups Printed- Total Volume

	Pats Ranch Road Southbound			Ivory Street Westbound			Pats Ranch Road Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
01:00 PM	5	31	36	0	1	1	34	1	35	72
01:15 PM	5	37	42	1	6	7	37	2	39	88
01:30 PM	9	37	46	1	8	9	28	1	29	84
01:45 PM	17	42	59	0	2	2	31	16	47	108
Total	36	147	183	2	17	19	130	20	150	352
02:00 PM	18	42	60	5	7	12	36	35	71	143
02:15 PM	9	37	46	55	59	114	50	10	60	220
02:30 PM	5	52	57	2	10	12	41	2	43	112
02:45 PM	2	51	53	2	2	4	46	1	47	104
Total	34	182	216	64	78	142	173	48	221	579
Grand Total	70	329	399	66	95	161	303	68	371	931
Apprch %	17.5	82.5		41	59		81.7	18.3		
Total %	7.5	35.3	42.9	7.1	10.2	17.3	32.5	7.3	39.8	

	Pats Ranch Road Southbound			Ivory Street Westbound			Pats Ranch Road Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 01:45 PM										
01:45 PM	17	42	59	0	2	2	31	16	47	108
02:00 PM	**18**	42	**60**	5	7	12	36	**35**	**71**	143
02:15 PM	9	37	46	**55**	**59**	**114**	**50**	10	60	**220**
02:30 PM	5	**52**	57	2	10	12	41	2	43	112
Total Volume	49	173	222	62	78	140	158	63	221	583
% App. Total	22.1	77.9		44.3	55.7		71.5	28.5		
PHF	.681	.832	.925	.282	.331	.307	.790	.450	.778	.663

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Start Date : 5/1/2014
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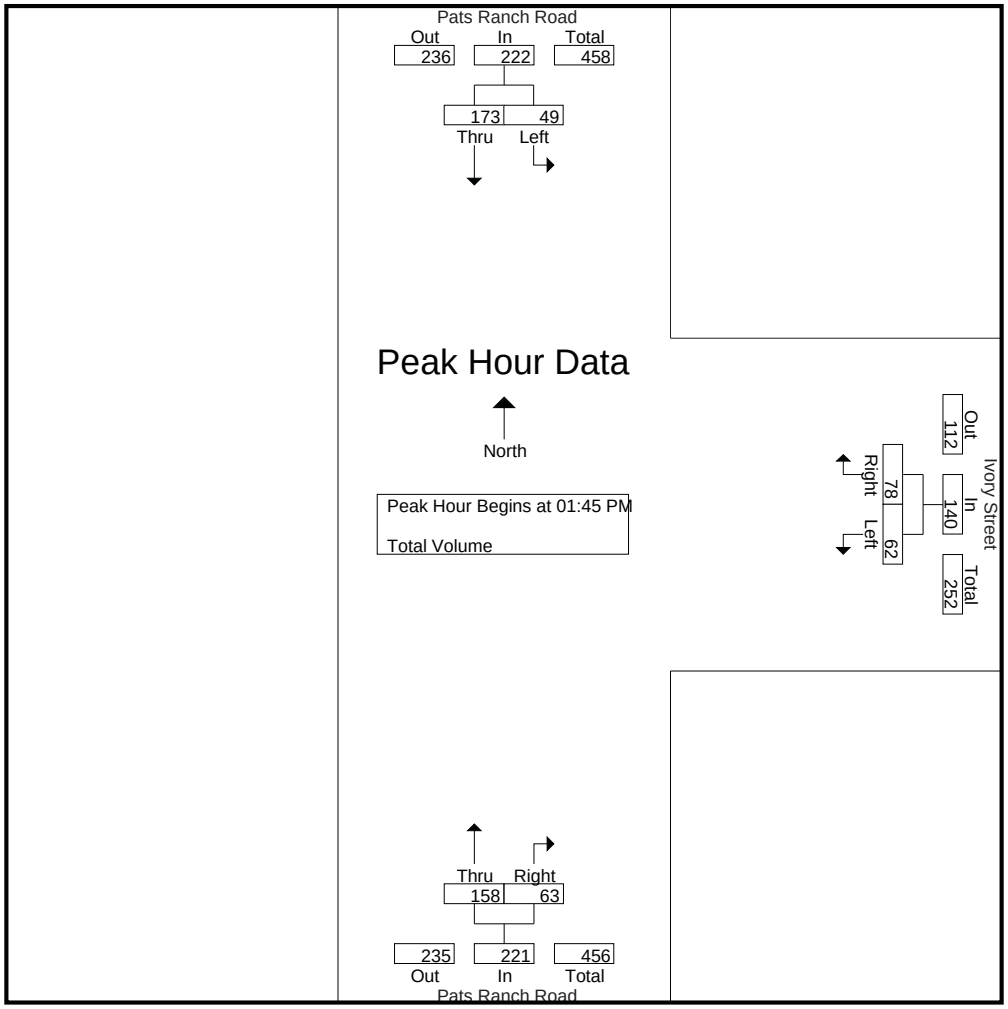

Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	01:45 PM			02:00 PM			01:45 PM		
+0 mins.	17	42	59	5	7	12	31	16	47
+15 mins.	**18**	42	**60**	**55**	**59**	**114**	36	**35**	**71**
+30 mins.	9	37	46	2	10	12	**50**	10	60
+45 mins.	5	**52**	57	2	2	4	41	2	43
Total Volume	49	173	222	64	78	142	158	63	221
% App. Total	22.1	77.9		45.1	54.9		71.5	28.5	
PHF	.681	.832	.925	.291	.331	.311	.790	.450	.778

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City of Jurupa Valley
N/S: Pats Ranch Road
E/W: Ivory Street
Weather: Clear

File Name : JVYPRIVPM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- Total Volume

	Pats Ranch Road Southbound			Ivory Street Westbound			Pats Ranch Road Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
04:00 PM	3	47	50	2	4	6	47	0	47	103
04:15 PM	5	46	51	2	5	7	43	5	48	106
04:30 PM	10	38	48	3	8	11	40	1	41	100
04:45 PM	4	56	60	0	6	6	43	2	45	111
Total	22	187	209	7	23	30	173	8	181	420
05:00 PM	6	62	68	1	5	6	45	1	46	120
05:15 PM	8	46	54	0	0	0	37	3	40	94
05:30 PM	7	74	81	1	7	8	55	4	59	148
05:45 PM	6	68	74	1	0	1	52	2	54	129
Total	27	250	277	3	12	15	189	10	199	491
Grand Total	49	437	486	10	35	45	362	18	380	911
Apprch %	10.1	89.9		22.2	77.8		95.3	4.7		
Total %	5.4	48	53.3	1.1	3.8	4.9	39.7	2	41.7	

	Pats Ranch Road Southbound			Ivory Street Westbound			Pats Ranch Road Northbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	6	62	68	**1**	5	6	45	1	46	120
05:15 PM	**8**	46	54	0	0	0	37	3	40	94
05:30 PM	7	**74**	**81**	1	**7**	**8**	**55**	**4**	**59**	**148**
05:45 PM	6	68	74	1	0	1	52	2	54	129
Total Volume	27	250	277	3	12	15	189	10	199	491
% App. Total	9.7	90.3		20	80		95	5		
PHF	.844	.845	.855	.750	.429	.469	.859	.625	.843	.829

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City of Jurupa Valley
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File Name : JVYPRIVPM
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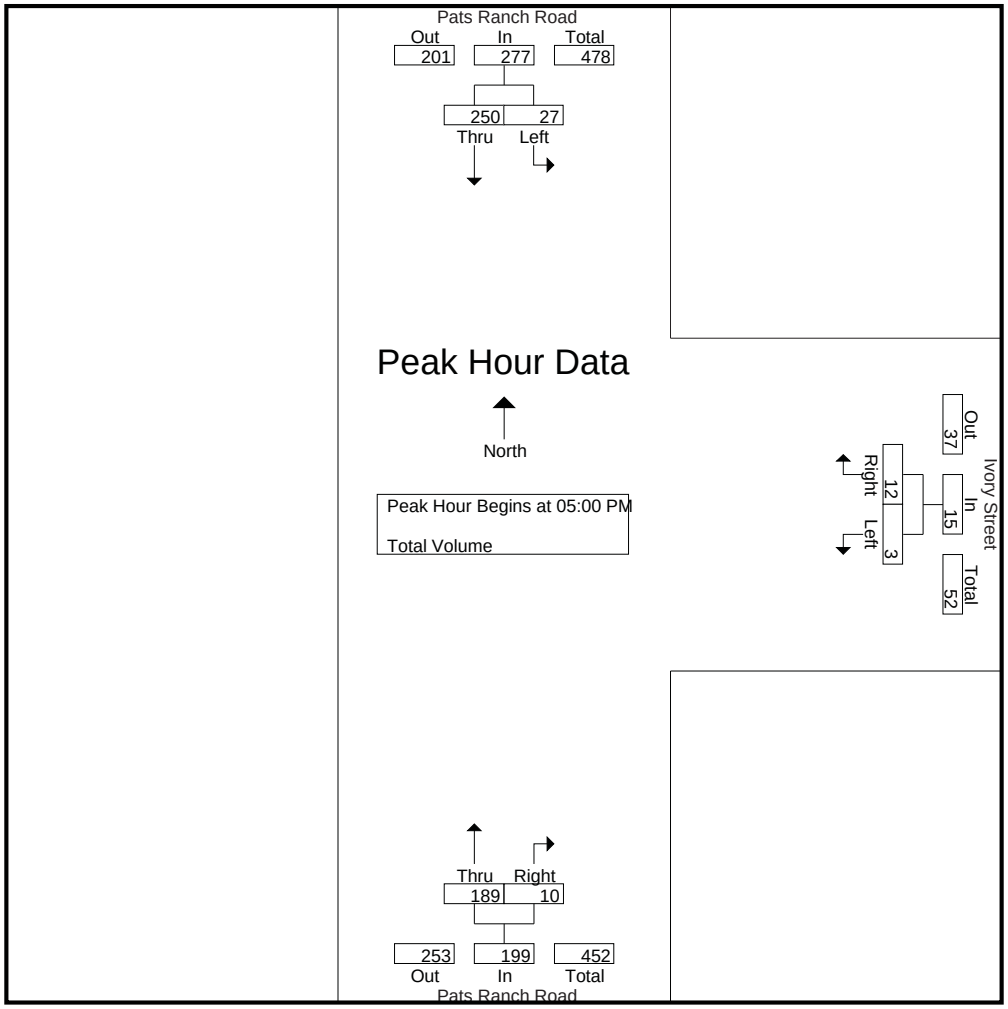

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM			04:00 PM			05:00 PM		
+0 mins.	6	62	68	2	4	6	45	1	46
+15 mins.	**8**	46	54	2	5	7	37	3	40
+30 mins.	7	**74**	**81**	**3**	**8**	**11**	**55**	**4**	**59**
+45 mins.	6	68	74	0	6	6	52	2	54
Total Volume	27	250	277	7	23	30	189	10	199
% App. Total	9.7	90.3		23.3	76.7		95	5	
PHF	.844	.845	.855	.583	.719	.682	.859	.625	.843

Location: Jurupa Valley
N/S: Pats Ranch Road
E/W: Ivory Street

Date: 5/1/2014
Weather: Clear

WEEKDAY

	North Leg Pats Ranch Road	East Leg Ivory Street	South Leg Pats Ranch Road	West Leg Ivory Street	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	4	0	0	4
7:30 AM	0	2	0	0	2
7:45 AM	0	0	0	0	0
8:00 AM	0	2	0	0	2
8:15 AM	0	1	0	0	1
8:30 AM	0	1	0	0	1
8:45 AM	0	1	0	0	1
TOTAL VOLUMES:	0	11	0	0	11

	North Leg Pats Ranch Road	East Leg Ivory Street	South Leg Pats Ranch Road	West Leg Ivory Street	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
1:00 PM	0	0	0	0	0
1:15 PM	0	0	0	0	0
1:30 PM	0	1	0	0	1
1:45 PM	0	1	0	0	1
2:00 PM	0	0	0	0	0
2:15 PM	0	0	0	0	0
2:30 PM	0	0	0	0	0
2:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	2	0	0	2

	North Leg Pats Ranch Road	East Leg Ivory Street	South Leg Pats Ranch Road	West Leg Ivory Street	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	1	0	0	1
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	2	0	0	2
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	3	0	0	3

Location: Jurupa Valley
N/S: Pats Ranch Road
E/W: Ivory Street

Date: 5/1/2014
Weather: Clear

WEEKDAY

	North Leg Pats Ranch Road	East Leg Ivory Street	South Leg Pats Ranch Road	West Leg Ivory Street	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	0	0	0	0	0
7:45 AM	0	0	0	0	0
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	0	0	0	0	0

	North Leg Pats Ranch Road	East Leg Ivory Street	South Leg Pats Ranch Road	West Leg Ivory Street	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
1:00 PM	0	0	0	0	0
1:15 PM	0	0	0	0	0
1:30 PM	0	0	0	0	0
1:45 PM	0	0	0	0	0
2:00 PM	0	0	0	0	0
2:15 PM	0	0	0	0	0
2:30 PM	0	0	0	0	0
2:45 PM	0	1	0	0	1
TOTAL VOLUMES:	0	1	0	0	1

	North Leg Pats Ranch Road	East Leg Ivory Street	South Leg Pats Ranch Road	West Leg Ivory Street	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	0	0	0	0	0
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	1	0	0	1
TOTAL VOLUMES:	0	1	0	0	1

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City of Jurupa Valley
N/S: Pats Ranch Road
E/W: Ivory Street
Weather: Clear

File Name : JVYPR68AM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- Total Volume

	Pats Ranch Road Southbound			68th Street Westbound			68th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
07:00 AM	12	29	41	71	3	74	45	80	125	240
07:15 AM	8	71	79	130	12	142	63	152	215	436
07:30 AM	4	72	76	122	18	140	88	130	218	434
07:45 AM	1	21	22	56	2	58	54	45	99	179
Total	25	193	218	379	35	414	250	407	657	1289
08:00 AM	2	30	32	55	1	56	56	39	95	183
08:15 AM	1	48	49	32	3	35	38	37	75	159
08:30 AM	1	26	27	36	5	41	57	38	95	163
08:45 AM	4	27	31	22	4	26	44	28	72	129
Total	8	131	139	145	13	158	195	142	337	634
Grand Total	33	324	357	524	48	572	445	549	994	1923
Apprch %	9.2	90.8		91.6	8.4		44.8	55.2		
Total %	1.7	16.8	18.6	27.2	2.5	29.7	23.1	28.5	51.7	

	Pats Ranch Road Southbound			68th Street Westbound			68th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	**12**	29	41	71	3	74	45	80	125	240
07:15 AM	8	71	**79**	**130**	12	**142**	63	**152**	215	**436**
07:30 AM	4	**72**	76	122	**18**	140	**88**	130	**218**	434
07:45 AM	1	21	22	56	2	58	54	45	99	179
Total Volume	25	193	218	379	35	414	250	407	657	1289
% App. Total	11.5	88.5		91.5	8.5		38.1	61.9		
PHF	.521	.670	.690	.729	.486	.729	.710	.669	.753	.739

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City of Jurupa Valley
N/S: Pats Ranch Road
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File Name : JVYPR68AM
Site Code : 05114187
Start Date : 5/1/2014
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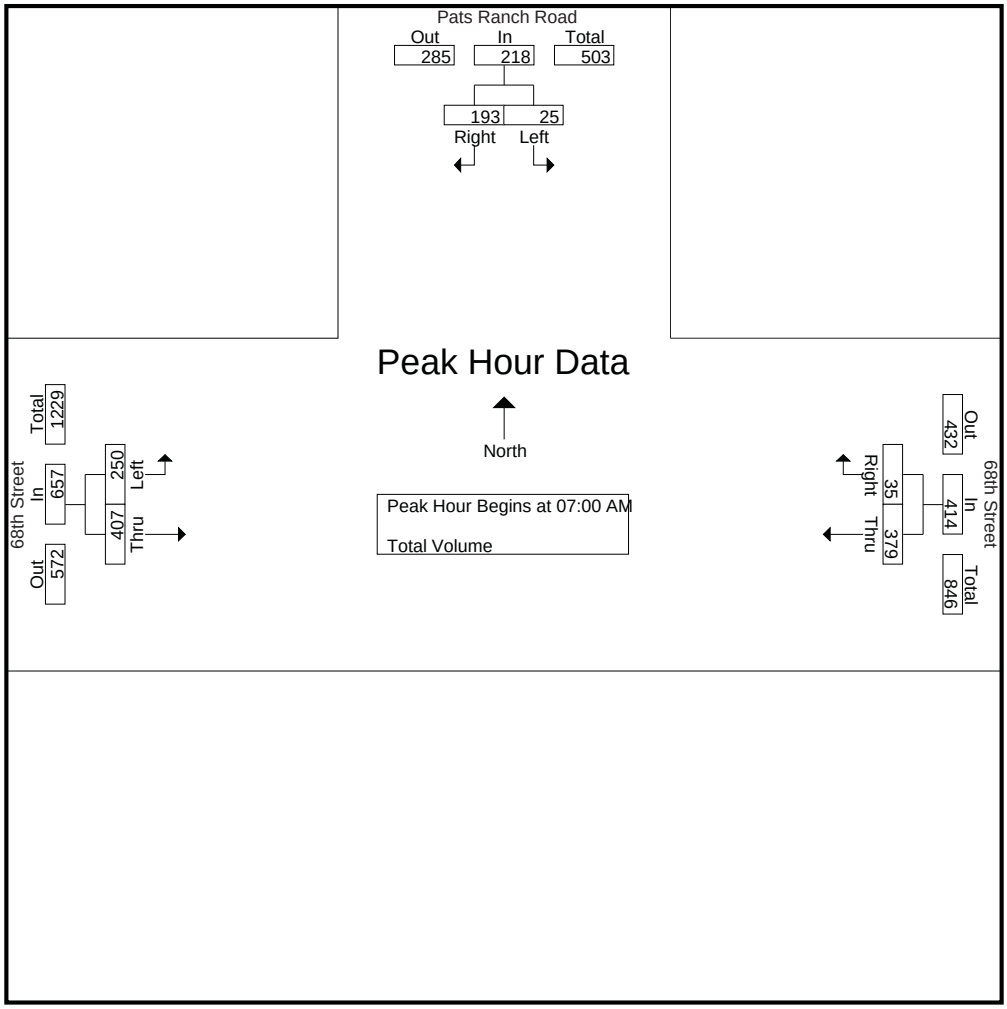

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	**12**	29	41	71	3	74	45	80	125
+15 mins.	8	71	**79**	**130**	12	**142**	63	**152**	215
+30 mins.	4	**72**	76	122	**18**	140	**88**	130	**218**
+45 mins.	1	21	22	56	2	58	54	45	99
Total Volume	25	193	218	379	35	414	250	407	657
% App. Total	11.5	88.5		91.5	8.5		38.1	61.9	
PHF	.521	.670	.690	.729	.486	.729	.710	.669	.753

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City of Jurupa Valley
N/S: Pats Ranch Road
E/W: Ivory Street
Weather: Clear

File Name : JVYPR68MD
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- Total Volume

	Pats Ranch Road Southbound			68th Street Westbound			68th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
01:00 PM	6	25	31	24	4	28	32	25	57	116
01:15 PM	3	35	38	21	5	26	34	29	63	127
01:30 PM	4	33	37	31	4	35	23	52	75	147
01:45 PM	11	32	43	16	5	21	45	69	114	178
Total	24	125	149	92	18	110	134	175	309	568
02:00 PM	5	41	46	46	7	53	64	71	135	234
02:15 PM	8	92	100	151	27	178	38	70	108	386
02:30 PM	8	47	55	62	4	66	38	52	90	211
02:45 PM	7	51	58	48	3	51	47	60	107	216
Total	28	231	259	307	41	348	187	253	440	1047
Grand Total	52	356	408	399	59	458	321	428	749	1615
Apprch %	12.7	87.3		87.1	12.9		42.9	57.1		
Total %	3.2	22	25.3	24.7	3.7	28.4	19.9	26.5	46.4	

	Pats Ranch Road Southbound			68th Street Westbound			68th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 02:00 PM										
02:00 PM	5	41	46	46	7	53	**64**	**71**	**135**	234
02:15 PM	**8**	**92**	**100**	**151**	**27**	**178**	38	70	108	**386**
02:30 PM	8	47	55	62	4	66	38	52	90	211
02:45 PM	7	51	58	48	3	51	47	60	107	216
Total Volume	28	231	259	307	41	348	187	253	440	1047
% App. Total	10.8	89.2		88.2	11.8		42.5	57.5		
PHF	.875	.628	.648	.508	.380	.489	.730	.891	.815	.678

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City of Jurupa Valley
N/S: Pats Ranch Road
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File Name : JVYPR68MD
Site Code : 05114187
Start Date : 5/1/2014
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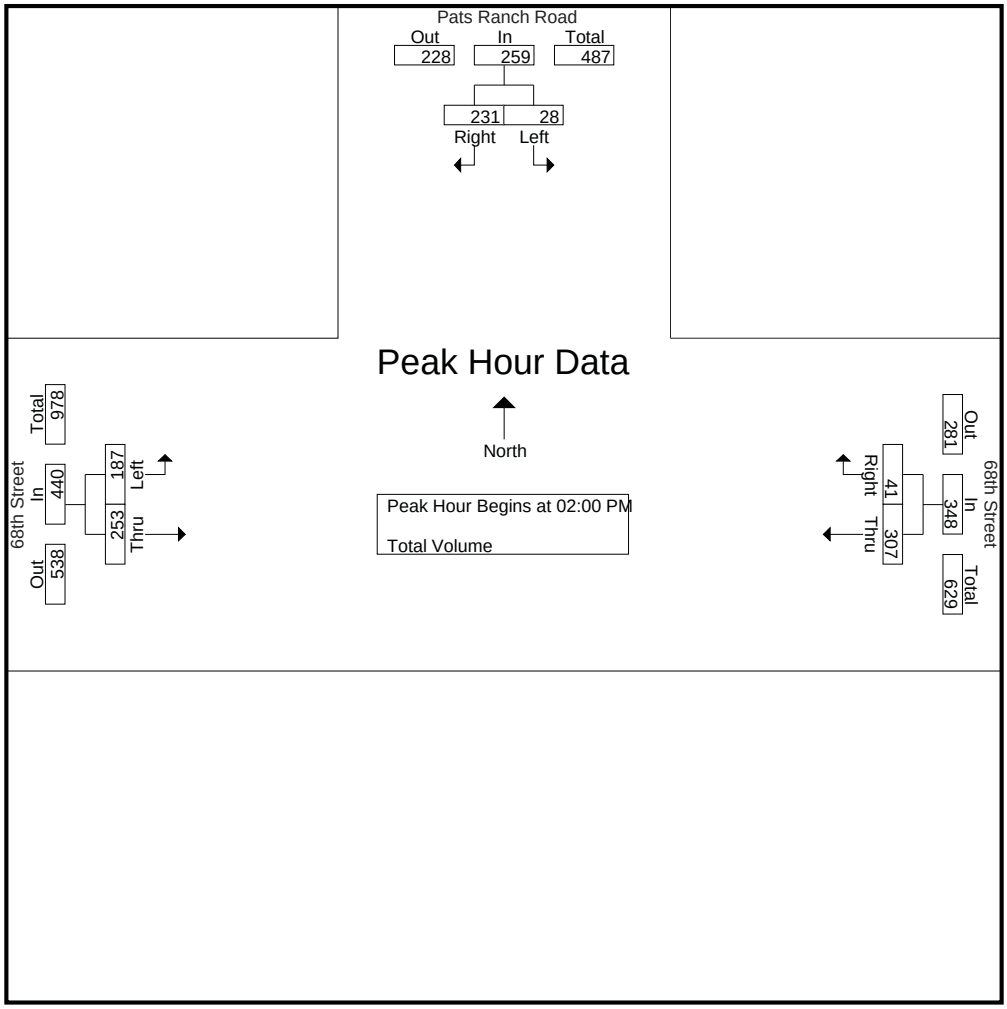

Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	02:00 PM			02:00 PM			01:45 PM		
+0 mins.	5	41	46	46	7	53	45	69	114
+15 mins.	**8**	**92**	**100**	**151**	**27**	**178**	**64**	**71**	**135**
+30 mins.	8	47	55	62	4	66	38	70	108
+45 mins.	7	51	58	48	3	51	38	52	90
Total Volume	28	231	259	307	41	348	185	262	447
% App. Total	10.8	89.2		88.2	11.8		41.4	58.6	
PHF	.875	.628	.648	.508	.380	.489	.723	.923	.828

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City of Jurupa Valley
N/S: Pats Ranch Road
E/W: Ivory Street
Weather: Clear

File Name : JVYPR68PM
Site Code : 05114187
Start Date : 5/1/2014
Page No : 1

Groups Printed- Total Volume

	Pats Ranch Road Southbound			68th Street Westbound			68th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
04:00 PM	2	48	50	38	4	42	42	63	105	197
04:15 PM	4	42	46	47	4	51	44	66	110	207
04:30 PM	1	42	43	34	2	36	38	47	85	164
04:45 PM	4	51	55	50	7	57	39	48	87	199
Total	11	183	194	169	17	186	163	224	387	767
05:00 PM	5	61	66	40	6	46	40	63	103	215
05:15 PM	4	38	42	38	0	38	41	53	94	174
05:30 PM	11	67	78	57	5	62	54	58	112	252
05:45 PM	10	67	77	74	5	79	54	58	112	268
Total	30	233	263	209	16	225	189	232	421	909
Grand Total	41	416	457	378	33	411	352	456	808	1676
Apprch %	9	91		92	8		43.6	56.4		
Total %	2.4	24.8	27.3	22.6	2	24.5	21	27.2	48.2	

	Pats Ranch Road Southbound			68th Street Westbound			68th Street Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	5	61	66	40	**6**	46	40	**63**	103	215
05:15 PM	4	38	42	38	0	38	41	53	94	174
05:30 PM	**11**	**67**	**78**	57	5	62	**54**	58	**112**	252
05:45 PM	10	67	77	**74**	5	**79**	54	58	112	**268**
Total Volume	30	233	263	209	16	225	189	232	421	909
% App. Total	11.4	88.6		92.9	7.1		44.9	55.1		
PHF	.682	.869	.843	.706	.667	.712	.875	.921	.940	.848

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File Name : JVYPR68PM
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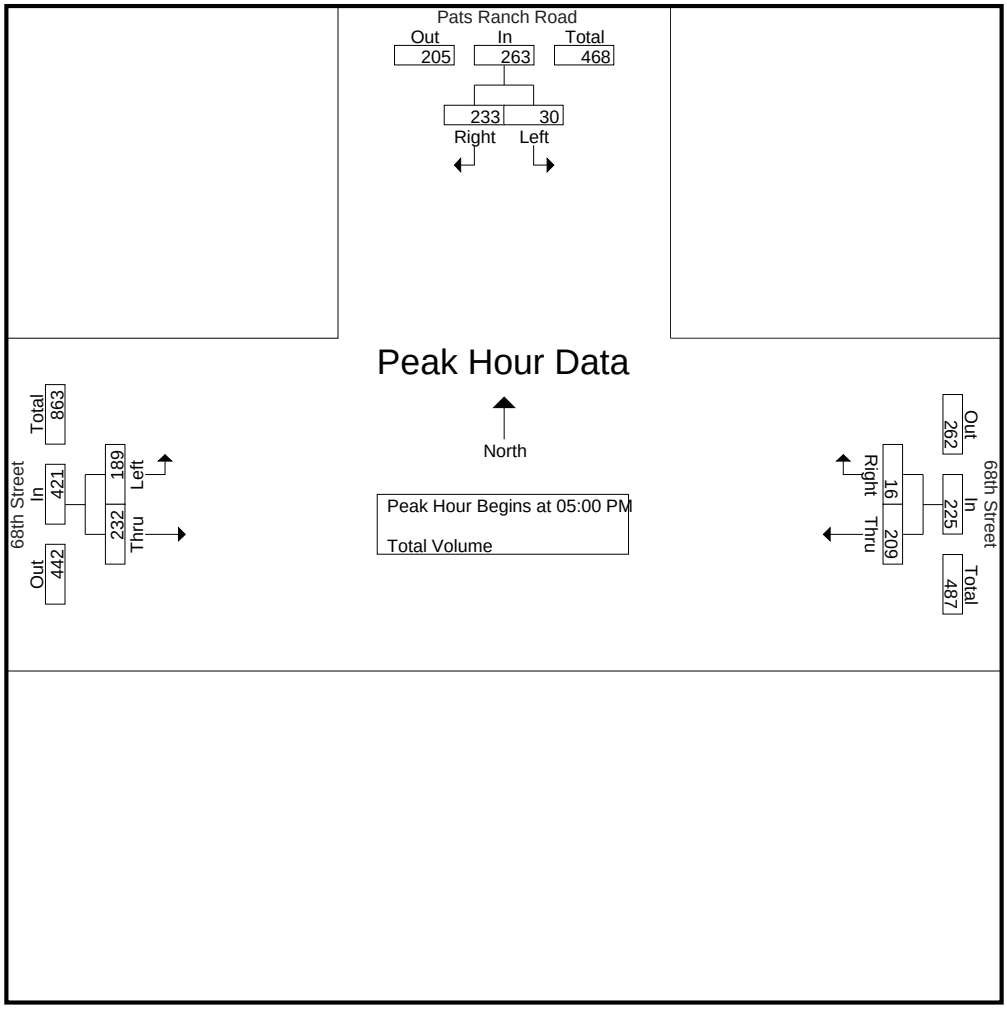

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM			05:00 PM			05:00 PM		
+0 mins.	5	61	66	40	**6**	46	40	**63**	103
+15 mins.	4	38	42	38	0	38	41	53	94
+30 mins.	**11**	**67**	**78**	57	5	62	**54**	58	**112**
+45 mins.	10	67	77	**74**	5	**79**	54	58	112
Total Volume	30	233	263	209	16	225	189	232	421
% App. Total	11.4	88.6		92.9	7.1		44.9	55.1	
PHF	.682	.869	.843	.706	.667	.712	.875	.921	.940

Location: Jurupa Valley
N/S: Pats Ranch Road
E/W: 68th Street

Date: 5/1/2014
Weather: Clear

WEEKDAY

	North Leg Pats Ranch Road	East Leg 68th Street	South Leg Pats Ranch Road	West Leg 68th Street	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
7:00 AM	0	0	0	0	0
7:15 AM	1	0	0	0	1
7:30 AM	3	0	0	0	3
7:45 AM	1	0	0	0	1
8:00 AM	0	0	0	0	0
8:15 AM	0	0	0	0	0
8:30 AM	4	0	0	0	4
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	9	0	0	0	9

	North Leg Pats Ranch Road	East Leg 68th Street	South Leg Pats Ranch Road	West Leg 68th Street	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
1:00 PM	0	0	0	0	0
1:15 PM	0	0	0	0	0
1:30 PM	1	0	0	0	1
1:45 PM	4	0	0	0	4
2:00 PM	8	0	0	0	8
2:15 PM	29	0	0	0	29
2:30 PM	1	0	0	0	1
2:45 PM	0	0	0	0	0
TOTAL VOLUMES:	43	0	0	0	43

	North Leg Pats Ranch Road	East Leg 68th Street	South Leg Pats Ranch Road	West Leg 68th Street	
	Pedestrians	**Pedestrians**	**Pedestrians**	**Pedestrians**	TOTAL
4:00 PM	1	0	0	0	1
4:15 PM	4	0	0	0	4
4:30 PM	1	0	0	0	1
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	2	0	0	0	2
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	8	0	0	0	8

Location: Jurupa Valley
N/S: Pats Ranch Road
E/W: 68th Street

Date: 5/1/2014
Weather: Clear

WEEKDAY

	North Leg Pats Ranch Road	East Leg 68th Street	South Leg Pats Ranch Road	West Leg 68th Street	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
7:00 AM	5	0	0	0	5
7:15 AM	3	0	0	0	3
7:30 AM	4	0	0	0	4
7:45 AM	0	0	0	0	0
8:00 AM	1	0	0	0	1
8:15 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0
8:45 AM	0	0	0	0	0
TOTAL VOLUMES:	13	0	0	0	13

	North Leg Pats Ranch Road	East Leg 68th Street	South Leg Pats Ranch Road	West Leg 68th Street	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
1:00 PM	0	0	0	0	0
1:15 PM	0	0	0	0	0
1:30 PM	0	0	0	0	0
1:45 PM	0	0	0	0	0
2:00 PM	2	0	0	0	2
2:15 PM	5	0	0	0	5
2:30 PM	0	0	0	0	0
2:45 PM	1	0	0	0	1
TOTAL VOLUMES:	8	0	0	0	8

	North Leg Pats Ranch Road	East Leg 68th Street	South Leg Pats Ranch Road	West Leg 68th Street	
	Bicycles	**Bicycles**	**Bicycles**	**Bicycles**	TOTAL
4:00 PM	0	0	0	0	0
4:15 PM	1	0	0	0	1
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	1	0	0	0	1
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	2	0	0	0	2
TOTAL VOLUMES:	4	0	0	0	4

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City of Jurupa Valley
N/S: Wineville Avenue
E/W: Limonite Avenue
Weather: Clear

File Name : JVYWILIAM
Site Code : 05114107
Start Date : 3/13/2014
Page No : 1

Groups Printed- Total Volume

	Wineville Avenue Southbound				Limonite Avenue Westbound				Wineville Avenue Northbound				Limonite Avenue 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 AM	7	6	48	61	7	170	11	188	8	12	7	27	21	107	12	140	416
07:15 AM	7	14	41	62	13	180	4	197	11	8	2	21	23	112	16	151	431
07:30 AM	7	22	35	64	6	179	9	194	13	30	16	59	17	125	18	160	477
07:45 AM	17	9	31	57	7	195	5	207	7	29	15	51	22	149	8	179	494
Total	38	51	155	244	33	724	29	786	39	79	40	158	83	493	54	630	1818
08:00 AM	5	21	25	51	7	178	6	191	7	20	8	35	11	143	11	165	442
08:15 AM	11	25	29	65	6	173	9	188	9	26	7	42	19	115	11	145	440
08:30 AM	6	25	28	59	5	151	10	166	10	21	8	39	19	117	10	146	410
08:45 AM	6	17	26	49	2	188	6	196	7	20	4	31	20	145	11	176	452
Total	28	88	108	224	20	690	31	741	33	87	27	147	69	520	43	632	1744
Grand Total	66	139	263	468	53	1414	60	1527	72	166	67	305	152	1013	97	1262	3562
Apprch %	14.1	29.7	56.2		3.5	92.6	3.9		23.6	54.4	22		12	80.3	7.7		
Total %	1.9	3.9	7.4	13.1	1.5	39.7	1.7	42.9	2	4.7	1.9	8.6	4.3	28.4	2.7	35.4	

	Wineville Avenue Southbound				Limonite Avenue Westbound				Wineville Avenue Northbound				Limonite Avenue 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 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	7	22	**35**	64	6	179	**9**	194	**13**	**30**	**16**	**59**	17	125	**18**	160	477
07:45 AM	**17**	9	31	57	**7**	**195**	5	**207**	7	29	15	51	**22**	**149**	8	**179**	**494**
08:00 AM	5	21	25	51	7	178	6	191	7	20	8	35	11	143	11	165	442
08:15 AM	11	**25**	29	**65**	6	173	9	188	9	26	7	42	19	115	11	145	440
Total Volume	40	77	120	237	26	725	29	780	36	105	46	187	69	532	48	649	1853
% App. Total	16.9	32.5	50.6		3.3	92.9	3.7		19.3	56.1	24.6		10.6	82	7.4		
PHF	.588	.770	.857	.912	.929	.929	.806	.942	.692	.875	.719	.792	.784	.893	.667	.906	.938

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City of Jurupa Valley
N/S: Wineville Avenue
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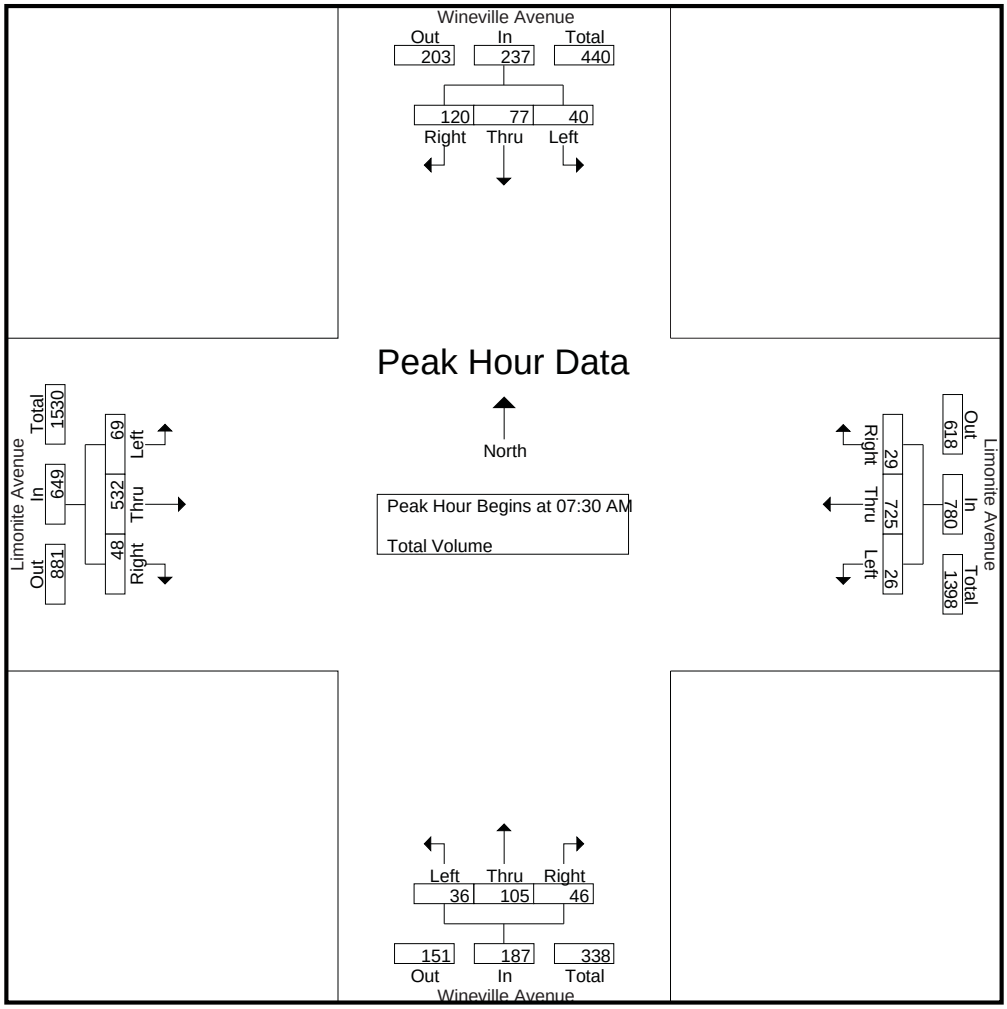
File Name : JVYWILIAM
Site Code : 05114107
Start Date : 3/13/2014
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:15 AM				07:30 AM				07:15 AM			
+0 mins.	7	6	**48**	61	**13**	180	4	197	**13**	**30**	**16**	**59**	**23**	112	16	151
+15 mins.	7	14	41	62	6	179	**9**	194	7	29	15	51	17	125	**18**	160
+30 mins.	7	**22**	35	**64**	7	**195**	5	**207**	7	20	8	35	22	**149**	8	**179**
+45 mins.	**17**	9	31	57	7	178	6	191	9	26	7	42	11	143	11	165
Total Volume	38	51	155	244	33	732	24	789	36	105	46	187	73	529	53	655
% App. Total	15.6	20.9	63.5		4.2	92.8	3		19.3	56.1	24.6		11.1	80.8	8.1	
PHF	.559	.580	.807	.953	.635	.938	.667	.953	.692	.875	.719	.792	.793	.888	.736	.915

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City of Jurupa Valley
N/S: Wineville Avenue
E/W: Limonite Avenue
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File Name : JVYWILIPM
Site Code : 05114107
Start Date : 3/13/2014
Page No : 1

Groups Printed- Total Volume

	Wineville Avenue Southbound				Limonite Avenue Westbound				Wineville Avenue Northbound				Limonite Avenue 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
04:00 PM	28	9	37	74	14	177	4	195	15	11	8	34	46	238	18	302	605
04:15 PM	35	20	31	86	8	188	14	210	10	9	6	25	35	252	9	296	617
04:30 PM	36	26	35	97	7	194	24	225	14	4	10	28	56	242	8	306	656
04:45 PM	34	14	59	107	13	227	14	254	20	9	8	37	43	209	18	270	668
Total	133	69	162	364	42	786	56	884	59	33	32	124	180	941	53	1174	2546
05:00 PM	34	18	46	98	13	188	18	219	13	17	5	35	42	234	14	290	642
05:15 PM	32	17	53	102	8	236	16	260	6	8	9	23	38	243	18	299	684
05:30 PM	35	32	46	113	12	195	16	223	18	9	12	39	35	226	14	275	650
05:45 PM	26	23	49	98	19	234	24	277	14	12	7	33	54	253	19	326	734
Total	127	90	194	411	52	853	74	979	51	46	33	130	169	956	65	1190	2710
Grand Total	260	159	356	775	94	1639	130	1863	110	79	65	254	349	1897	118	2364	5256
Apprch %	33.5	20.5	45.9		5	88	7		43.3	31.1	25.6		14.8	80.2	5		
Total %	4.9	3	6.8	14.7	1.8	31.2	2.5	35.4	2.1	1.5	1.2	4.8	6.6	36.1	2.2	45	

	Wineville Avenue Southbound				Limonite Avenue Westbound				Wineville Avenue Northbound				Limonite Avenue 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 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	34	18	46	98	13	188	18	219	13	**17**	5	35	42	234	14	290	642
05:15 PM	32	17	**53**	102	8	**236**	16	260	6	8	9	23	38	243	18	299	684
05:30 PM	**35**	**32**	46	**113**	12	195	16	223	**18**	9	**12**	**39**	35	226	14	275	650
05:45 PM	26	23	49	98	**19**	234	**24**	**277**	14	12	7	33	**54**	**253**	**19**	**326**	**734**
Total Volume	127	90	194	411	52	853	74	979	51	46	33	130	169	956	65	1190	2710
% App. Total	30.9	21.9	47.2		5.3	87.1	7.6		39.2	35.4	25.4		14.2	80.3	5.5		
PHF	.907	.703	.915	.909	.684	.904	.771	.884	.708	.676	.688	.833	.782	.945	.855	.913	.923

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File Name : JVYWILIPM
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Start Date : 3/13/2014
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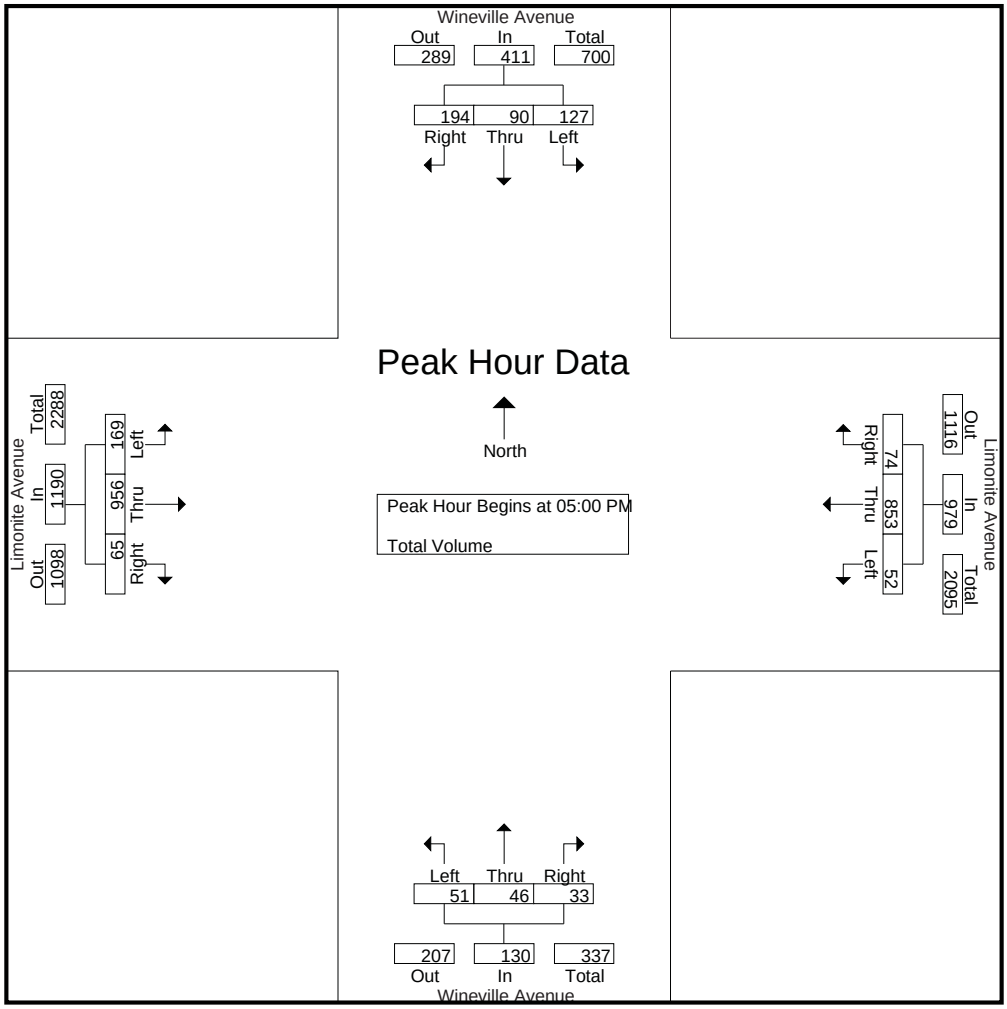

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				05:00 PM				04:45 PM				05:00 PM			
+0 mins.	34	14	**59**	107	13	188	18	219	**20**	9	8	37	42	234	14	290
+15 mins.	34	18	46	98	8	**236**	16	260	13	**17**	5	35	38	243	18	299
+30 mins.	32	17	53	102	12	195	16	223	6	8	9	23	35	226	14	275
+45 mins.	**35**	**32**	46	**113**	**19**	234	**24**	**277**	18	9	**12**	**39**	**54**	**253**	**19**	**326**
Total Volume	135	81	204	420	52	853	74	979	57	43	34	134	169	956	65	1190
% App. Total	32.1	19.3	48.6		5.3	87.1	7.6		42.5	32.1	25.4		14.2	80.3	5.5	
PHF	.964	.633	.864	.929	.684	.904	.771	.884	.713	.632	.708	.859	.782	.945	.855	.913

Counts Unlimited, Inc

PO Box 1178
Corona, CA 92880
Phone: 951-268-6268
email: counts@countsunlimited.com

City of Eastvale
Limonite Avenue
E/ Hamner Avenue
24 Hour Directional Classification Count

ESV009C
Site Code: 051-14107

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/20/14	0	118	20	0	2	0	0	0	4	0	0	0	0	144
01:00	0	59	12	0	2	0	0	1	2	**1**	0	0	0	77
02:00	1	57	13	0	1	0	0	0	2	0	0	0	0	74
03:00	2	93	29	0	7	0	0	1	7	0	2	0	0	141
04:00	0	236	82	2	33	0	0	0	11	0	**3**	0	0	367
05:00	2	347	118	3	30	0	0	9	3	0	1	0	0	513
06:00	**3**	605	154	5	49	1	0	6	9	0	0	0	0	832
07:00	3	**1005**	**211**	6	46	3	0	9	9	1	0	0	0	**1293**
08:00	2	913	191	4	34	12	0	9	13	0	2	0	0	1180
09:00	0	782	181	7	48	15	0	**12**	**19**	0	0	0	**1**	1065
10:00	1	674	199	**10**	36	**17**	**2**	12	9	0	1	0	0	961
11:00	1	708	196	4	**62**	10	0	6	4	0	1	0	0	992
12 PM	2	827	202	6	50	**13**	0	5	11	0	4	0	0	1120
13:00	**4**	803	216	5	46	6	0	10	8	0	0	0	0	1098
14:00	1	925	198	2	64	9	0	9	13	0	0	0	0	1221
15:00	4	**1037**	**280**	4	**82**	5	**1**	14	**15**	**1**	1	0	**2**	**1446**
16:00	4	963	205	5	45	4	0	**16**	7	1	**5**	0	0	1255
17:00	3	915	232	3	45	5	0	14	4	0	1	0	2	1224
18:00	2	860	213	6	38	1	1	6	2	0	1	0	1	1131
19:00	2	873	198	0	34	1	0	2	2	0	0	0	0	1112
20:00	1	616	147	**8**	27	0	0	2	1	0	0	0	0	802
21:00	0	487	96	0	11	0	0	3	1	0	0	0	0	598
22:00	1	332	71	0	4	0	0	0	2	0	0	0	0	410
23:00	0	208	23	2	5	0	0	0	0	0	0	0	0	238
Total	39	14443	3487	82	801	102	4	146	158	4	22	0	6	19294
Percent	0.2%	74.9%	18.1%	0.4%	4.2%	0.5%	0.0%	0.8%	0.8%	0.0%	0.1%	0.0%	0.0%	
AM Peak	06:00	07:00	07:00	10:00	11:00	10:00	10:00	09:00	09:00	01:00	04:00		09:00	07:00
Vol.	3	1005	211	10	62	17	2	12	19	1	3		1	1293
PM Peak	13:00	15:00	15:00	20:00	15:00	12:00	15:00	16:00	15:00	15:00	16:00		15:00	15:00
Vol.	4	1037	280	8	82	13	1	16	15	1	5		2	1446
Grand Total	39	14443	3487	82	801	102	4	146	158	4	22	0	6	19294
Percent	0.2%	74.9%	18.1%	0.4%	4.2%	0.5%	0.0%	0.8%	0.8%	0.0%	0.1%	0.0%	0.0%	

Counts Unlimited, Inc

PO Box 1178
Corona, CA 92880
Phone: 951-268-6268
email: counts@countsunlimited.com

City of Eastvale
Limonite Avenue
E/ Hamner Avenue
24 Hour Directional Classification Count

ESV009C
Site Code: 051-14107

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/20/14	1	176	47	1	14	0	0	2	0	0	1	0	0	242
01:00	0	80	31	1	6	0	0	0	1	0	0	0	0	119
02:00	0	79	20	1	3	0	0	1	1	0	0	0	0	105
03:00	0	89	30	0	9	0	0	2	2	0	0	0	0	132
04:00	0	108	48	3	25	0	0	0	0	0	2	0	0	186
05:00	4	319	157	7	85	4	0	7	1	0	1	0	0	585
06:00	**5**	501	**224**	8	**109**	5	0	**19**	**12**	1	**3**	0	0	**887**
07:00	4	531	212	11	75	1	0	19	3	0	1	0	0	857
08:00	1	469	189	5	82	1	0	15	9	0	1	0	0	772
09:00	0	401	183	14	66	**6**	0	16	9	0	1	0	0	696
10:00	3	468	216	**15**	75	2	0	15	6	**2**	0	0	0	802
11:00	3	**541**	219	8	78	5	0	6	8	0	1	0	0	869
12 PM	2	659	244	5	68	2	0	**15**	5	0	**3**	0	**1**	1004
13:00	4	663	235	**11**	**83**	1	0	9	6	0	0	0	0	1012
14:00	1	704	**296**	5	80	1	0	13	**10**	0	2	0	0	1112
15:00	5	719	252	8	56	**5**	0	7	8	0	1	0	0	1061
16:00	2	710	222	1	69	0	0	12	3	0	1	0	0	1020
17:00	4	866	242	1	61	0	0	10	4	0	0	0	0	1188
18:00	**6**	**911**	230	1	69	0	0	5	5	0	0	**1**	0	**1228**
19:00	5	865	236	1	71	2	0	11	0	0	0	0	0	1191
20:00	4	805	253	1	43	0	0	4	1	0	0	0	0	1111
21:00	3	690	192	1	35	0	0	4	1	0	0	0	0	926
22:00	2	504	140	2	29	0	0	1	0	0	1	0	0	679
23:00	2	321	68	1	16	0	0	0	0	0	0	0	0	408
Total	61	12179	4186	112	1307	35	0	193	95	3	19	1	1	18192
Percent	0.3%	66.9%	23.0%	0.6%	7.2%	0.2%	0.0%	1.1%	0.5%	0.0%	0.1%	0.0%	0.0%	
AM Peak	06:00	11:00	06:00	10:00	06:00	09:00		06:00	06:00	10:00	06:00			06:00
Vol.	5	541	224	15	109	6		19	12	2	3			887
PM Peak	18:00	18:00	14:00	13:00	13:00	15:00		12:00	14:00		12:00	18:00	12:00	18:00
Vol.	6	911	296	11	83	5		15	10		3	1	1	1228
Grand Total	61	12179	4186	112	1307	35	0	193	95	3	19	1	1	18192
Percent	0.3%	66.9%	23.0%	0.6%	7.2%	0.2%	0.0%	1.1%	0.5%	0.0%	0.1%	0.0%	0.0%	

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City of Eastvale
Limonite Avenue
E/ Hamner Avenue
24 Hour Directional Classification Count

ESV009C
Site Code: 051-14107

Eastbound, Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/20/14	1	294	67	1	16	0	0	2	4	0	1	0	0	386
01:00	0	139	43	1	8	0	0	1	3	1	0	0	0	196
02:00	1	136	33	1	4	0	0	1	3	0	0	0	0	179
03:00	2	182	59	0	16	0	0	3	9	0	2	0	0	273
04:00	0	344	130	5	58	0	0	0	11	0	**5**	0	0	553
05:00	6	666	275	10	115	4	0	16	4	0	2	0	0	1098
06:00	**8**	1106	378	13	**158**	6	0	25	21	1	3	0	0	1719
07:00	7	**1536**	**423**	17	121	4	0	**28**	12	1	1	0	0	**2150**
08:00	3	1382	380	9	116	13	0	24	22	0	3	0	0	1952
09:00	0	1183	364	21	114	**21**	0	28	**28**	0	1	0	**1**	1761
10:00	4	1142	415	**25**	111	19	**2**	27	15	**2**	1	0	0	1763
11:00	4	1249	415	12	140	15	0	12	12	0	2	0	0	1861
12 PM	4	1486	446	11	118	**15**	0	20	16	0	**7**	0	1	2124
13:00	8	1466	451	**16**	129	7	0	19	14	0	0	0	0	2110
14:00	2	1629	494	7	**144**	10	0	22	**23**	0	2	0	0	2333
15:00	**9**	1756	**532**	12	138	10	**1**	21	23	**1**	2	0	**2**	**2507**
16:00	6	1673	427	6	114	4	0	**28**	10	1	6	0	0	2275
17:00	7	**1781**	474	4	106	5	0	24	8	0	1	0	2	2412
18:00	8	1771	443	7	107	1	1	11	7	0	1	**1**	1	2359
19:00	7	1738	434	1	105	3	0	13	2	0	0	0	0	2303
20:00	5	1421	400	9	70	0	0	6	2	0	0	0	0	1913
21:00	3	1177	288	1	46	0	0	7	2	0	0	0	0	1524
22:00	3	836	211	2	33	0	0	1	2	0	1	0	0	1089
23:00	2	529	91	3	21	0	0	0	0	0	0	0	0	646
Total	100	26622	7673	194	2108	137	4	339	253	7	41	1	7	37486
Percent	0.3%	71.0%	20.5%	0.5%	5.6%	0.4%	0.0%	0.9%	0.7%	0.0%	0.1%	0.0%	0.0%	
AM Peak	06:00	07:00	07:00	10:00	06:00	09:00	10:00	07:00	09:00	10:00	04:00		09:00	07:00
Vol.	8	1536	423	25	158	21	2	28	28	2	5		1	2150
PM Peak	15:00	17:00	15:00	13:00	14:00	12:00	15:00	16:00	14:00	15:00	12:00	18:00	15:00	15:00
Vol.	9	1781	532	16	144	15	1	28	23	1	7	1	2	2507
Grand Total	100	26622	7673	194	2108	137	4	339	253	7	41	1	7	37486
Percent	0.3%	71.0%	20.5%	0.5%	5.6%	0.4%	0.0%	0.9%	0.7%	0.0%	0.1%	0.0%	0.0%	

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City of Eastvale
Hamner Avenue
N/ 68th Street
24 Hour Directional Volume Count

ESV004
Site Code: 051-14187

Start Time	08-May-14 Thu	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		14	166			14	123				
12:15		10	99			26	142				
12:30		17	133			13	112				
12:45		7	134	48	532	14	110	67	487	115	1019
01:00		3	117			6	112				
01:15		5	117			11	113				
01:30		6	109			10	142				
01:45		7	122	21	465	10	113	37	480	58	945
02:00		9	142			7	139				
02:15		7	150			11	156				
02:30		6	160			6	158				
02:45		5	**167**	27	619	3	176	27	629	54	1248
03:00		7	**230**			3	200				
03:15		10	**223**			7	213				
03:30		7	**218**			10	176				
03:45		20	156	44	827	4	189	24	778	68	1605
04:00		14	184			12	184				
04:15		19	147			7	197				
04:30		21	154			8	215				
04:45		31	197	85	682	20	171	47	767	132	1449
05:00		31	165			19	194				
05:15		36	167			28	188				
05:30		57	204			20	**218**				
05:45		51	165	175	701	23	**203**	90	803	265	1504
06:00		53	189			38	**220**				
06:15		79	171			60	**198**				
06:30		105	166			74	159				
06:45		125	140	362	666	85	174	257	751	619	1417
07:00		148	172			**155**	175				
07:15		**172**	176			**222**	150				
07:30		**252**	154			**147**	143				
07:45		**225**	145	797	647	**109**	125	633	593	1430	1240
08:00		**178**	137			101	117				
08:15		140	123			113	123				
08:30		158	105			107	118				
08:45		123	110	599	475	74	114	395	472	994	947
09:00		107	85			71	101				
09:15		115	79			77	110				
09:30		99	87			102	89				
09:45		103	60	424	311	92	73	342	373	766	684
10:00		102	70			85	67				
10:15		94	54			82	72				
10:30		114	36			86	61				
10:45		128	28	438	188	81	35	334	235	772	423
11:00		113	23			106	49				
11:15		134	22			107	26				
11:30		132	19			117	28				
11:45		119	11	498	75	72	29	402	132	900	207
Total		3518	6188	3518	6188	2655	6500	2655	6500	6173	12688
Combined Total		9706		9706		9155		9155		18861	
AM Peak	-	07:15	-	-	-	07:00	-	-	-	-	-
Vol.	-	827	-	-	-	633	-	-	-	-	-
P.H.F.		0.820				0.713					
PM Peak	-	-	02:45	-	-	-	05:30	-	-	-	-
Vol.	-	-	838	-	-	-	839	-	-	-	-
P.H.F.			0.911				0.953				
Percentage		36.2%	63.8%			29.0%	71.0%				
ADT/AADT		ADT 18,861		AADT 18,861							

Counts Unlimited, Inc

PO Box 1178
Corona, CA 92880
Phone: 951-268-6268
email: counts@countsunlimited.com

City of Eastvale
Limonite Avenue
E/ Interstate 15 Northbound Ramps
24 Hour Directional Classification Count

ESV010C
Site Code: 051-14107

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/20/14	1	127	42	1	20	2	0	1	0	**1**	0	0	0	195
01:00	1	66	17	0	5	0	0	0	0	0	0	0	0	89
02:00	0	48	14	0	7	0	0	0	1	0	0	0	0	70
03:00	1	61	25	1	10	1	0	1	0	0	0	0	0	100
04:00	0	89	45	3	28	0	0	1	3	0	0	0	0	169
05:00	0	152	83	1	44	2	0	2	3	0	0	0	0	287
06:00	**4**	290	154	6	98	3	**1**	5	7	0	5	0	0	573
07:00	4	429	207	**11**	84	3	0	10	7	0	14	0	**1**	770
08:00	2	368	220	5	96	2	0	9	**11**	0	13	**1**	0	727
09:00	1	435	226	6	81	2	0	9	5	0	13	0	0	778
10:00	2	526	278	8	107	**7**	0	**14**	9	0	**16**	0	0	967
11:00	4	**615**	**302**	8	**159**	5	0	7	6	0	9	0	0	**1115**
12 PM	6	719	282	**14**	160	**4**	0	16	13	0	1	0	0	1215
13:00	3	719	335	11	121	1	0	12	**17**	0	**3**	0	0	1222
14:00	7	751	388	13	151	4	**1**	11	10	0	1	0	0	1337
15:00	8	859	**405**	8	161	4	1	**26**	4	0	2	0	0	1478
16:00	4	920	392	8	155	0	0	15	3	0	0	0	0	1497
17:00	**9**	958	396	10	**165**	1	0	20	4	0	0	**1**	0	**1564**
18:00	5	**963**	401	7	139	0	0	18	8	0	2	0	0	1543
19:00	8	918	363	6	124	0	0	5	3	0	0	0	0	1427
20:00	6	735	293	3	75	1	0	5	5	0	2	0	0	1125
21:00	6	573	198	2	69	2	0	7	1	0	0	0	0	858
22:00	3	390	138	0	44	0	0	4	2	0	0	0	0	581
23:00	3	220	73	1	26	0	0	0	3	0	1	0	0	327
Total	88	11931	5277	133	2129	44	3	198	125	1	82	2	1	20014
Percent	0.4%	59.6%	26.4%	0.7%	10.6%	0.2%	0.0%	1.0%	0.6%	0.0%	0.4%	0.0%	0.0%	
AM Peak	06:00	11:00	11:00	07:00	11:00	10:00	06:00	10:00	08:00	00:00	10:00	08:00	07:00	11:00
Vol.	4	615	302	11	159	7	1	14	11	1	16	1	1	1115
PM Peak	17:00	18:00	15:00	12:00	17:00	12:00	14:00	15:00	13:00		13:00	17:00		17:00
Vol.	9	963	405	14	165	4	1	26	17		3	1		1564
Grand Total	88	11931	5277	133	2129	44	3	198	125	1	82	2	1	20014
Percent	0.4%	59.6%	26.4%	0.7%	10.6%	0.2%	0.0%	1.0%	0.6%	0.0%	0.4%	0.0%	0.0%	

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City of Eastvale
Limonite Avenue
E/ Interstate 15 Northbound Ramps
24 Hour Directional Classification Count

ESV010C
Site Code: 051-14107

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/20/14	0	49	28	0	7	0	0	2	0	0	0	0	0	86
01:00	0	34	12	1	7	0	0	0	0	0	1	0	0	55
02:00	0	32	20	2	8	1	0	0	1	0	0	0	0	64
03:00	0	114	56	2	20	0	0	2	0	0	0	0	0	194
04:00	2	318	158	4	68	1	0	11	4	0	0	0	0	566
05:00	4	521	236	9	**124**	3	0	20	12	1	5	0	1	936
06:00	6	622	250	7	116	4	0	20	**13**	0	4	0	0	1042
07:00	**8**	**869**	**292**	**11**	91	2	0	**25**	11	1	**21**	0	0	**1331**
08:00	2	701	252	3	101	2	0	18	9	**2**	11	0	**2**	1103
09:00	1	622	258	4	83	1	0	14	8	0	13	0	0	1004
10:00	0	596	271	11	65	3	0	19	5	1	14	0	0	985
11:00	0	684	274	9	84	**5**	0	17	11	1	10	0	1	1096
12 PM	**3**	762	264	3	86	1	0	22	5	0	2	0	0	1148
13:00	3	741	256	5	79	**4**	0	20	**8**	0	4	0	**1**	1121
14:00	3	853	280	5	82	1	0	19	6	2	4	0	1	**1256**
15:00	2	776	231	4	**87**	1	0	22	4	2	**14**	0	0	1143
16:00	1	825	**299**	1	75	2	0	12	3	0	1	**1**	0	1220
17:00	2	**865**	244	4	66	3	0	20	2	0	2	0	0	1208
18:00	2	668	197	**9**	63	2	0	**26**	3	**4**	0	0	0	974
19:00	2	776	234	1	64	0	0	7	1	0	0	0	0	1085
20:00	2	573	158	3	39	2	0	7	0	0	0	0	0	784
21:00	0	477	129	0	34	0	0	4	3	1	0	0	0	648
22:00	1	245	51	1	25	0	0	3	0	0	1	0	0	327
23:00	0	155	48	0	6	0	0	0	0	0	0	0	0	209
Total	44	12878	4498	99	1480	38	0	310	109	15	107	1	6	19585
Percent	0.2%	65.8%	23.0%	0.5%	7.6%	0.2%	0.0%	1.6%	0.6%	0.1%	0.5%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	07:00	05:00	11:00		07:00	06:00	08:00	07:00		08:00	07:00
Vol.	8	869	292	11	124	5		25	13	2	21		2	1331
PM Peak	12:00	17:00	16:00	18:00	15:00	13:00		18:00	13:00	18:00	15:00	16:00	13:00	14:00
Vol.	3	865	299	9	87	4		26	8	4	14	1	1	1256
Grand Total	44	12878	4498	99	1480	38	0	310	109	15	107	1	6	19585
Percent	0.2%	65.8%	23.0%	0.5%	7.6%	0.2%	0.0%	1.6%	0.6%	0.1%	0.5%	0.0%	0.0%	

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ESV010C
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Eastbound, Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
03/20/14	1	176	70	1	27	2	0	3	0	1	0	0	0	281
01:00	1	100	29	1	12	0	0	0	0	0	1	0	0	144
02:00	0	80	34	2	15	1	0	0	2	0	0	0	0	134
03:00	1	175	81	3	30	1	0	3	0	0	0	0	0	294
04:00	2	407	203	7	96	1	0	12	7	0	0	0	0	735
05:00	4	673	319	10	168	5	0	22	15	1	5	0	1	1223
06:00	10	912	404	13	214	7	**1**	25	**20**	0	9	0	0	1615
07:00	**12**	1298	499	**22**	175	5	0	**35**	18	1	**35**	0	1	2101
08:00	4	1069	472	8	197	4	0	27	20	**2**	24	**1**	**2**	1830
09:00	2	1057	484	10	164	3	0	23	13	0	26	0	0	1782
10:00	2	1122	549	19	172	**10**	0	33	14	1	30	0	0	1952
11:00	4	**1299**	**576**	17	**243**	10	0	24	17	1	19	0	1	**2211**
12 PM	9	1481	546	17	246	**5**	0	38	18	0	3	0	0	2363
13:00	6	1460	591	16	200	5	0	32	**25**	0	7	0	**1**	2343
14:00	10	1604	668	**18**	233	5	**1**	30	16	2	5	0	1	2593
15:00	10	1635	636	12	**248**	5	1	**48**	8	2	**16**	0	0	2621
16:00	5	1745	**691**	9	230	2	0	27	6	0	1	**1**	0	2717
17:00	**11**	**1823**	640	14	231	4	0	40	6	0	2	1	0	**2772**
18:00	7	1631	598	16	202	2	0	44	11	**4**	2	0	0	2517
19:00	10	1694	597	7	188	0	0	12	4	0	0	0	0	2512
20:00	8	1308	451	6	114	3	0	12	5	0	2	0	0	1909
21:00	6	1050	327	2	103	2	0	11	4	1	0	0	0	1506
22:00	4	635	189	1	69	0	0	7	2	0	1	0	0	908
23:00	3	375	121	1	32	0	0	0	3	0	1	0	0	536
Total	132	24809	9775	232	3609	82	3	508	234	16	189	3	7	39599
Percent	0.3%	62.7%	24.7%	0.6%	9.1%	0.2%	0.0%	1.3%	0.6%	0.0%	0.5%	0.0%	0.0%	
AM Peak	07:00	11:00	11:00	07:00	11:00	10:00	06:00	07:00	06:00	08:00	07:00	08:00	08:00	11:00
Vol.	12	1299	576	22	243	10	1	35	20	2	35	1	2	2211
PM Peak	17:00	17:00	16:00	14:00	15:00	12:00	14:00	15:00	13:00	18:00	15:00	16:00	13:00	17:00
Vol.	11	1823	691	18	248	5	1	48	25	4	16	1	1	2772
Grand Total	132	24809	9775	232	3609	82	3	508	234	16	189	3	7	39599
Percent	0.3%	62.7%	24.7%	0.6%	9.1%	0.2%	0.0%	1.3%	0.6%	0.0%	0.5%	0.0%	0.0%	

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City of Jurupa Valley
Pats Ranch Road
S/ 65th Street
24 Hour Directional Classification Count

JVY001
Site Code: 051-14187

Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
05/08/14	0	8	0	0	1	0	0	0	0	0	0	0	0	0	9
01:00	0	4	1	0	0	0	0	0	0	0	0	0	0	0	5
02:00	0	5	2	0	1	0	0	0	0	0	0	0	0	0	8
03:00	0	7	5	0	0	0	0	0	0	0	0	0	0	0	12
04:00	1	32	14	0	0	0	0	0	0	0	0	0	0	0	47
05:00	0	49	15	0	4	0	0	0	0	0	0	0	0	2	70
06:00	1	91	18	0	6	0	0	0	0	0	0	0	0	4	120
07:00	2	236	62	0	14	0	0	0	0	0	0	0	0	5	319
08:00	0	169	44	0	14	0	0	1	0	0	0	0	0	6	234
09:00	0	121	34	2	9	0	0	0	0	0	0	0	0	2	168
10:00	1	117	36	1	10	0	0	0	0	0	0	0	0	3	168
11:00	0	111	38	0	8	0	0	1	0	0	0	0	0	3	161
12 PM	0	112	28	1	10	0	0	0	0	0	0	0	0	4	155
13:00	3	102	35	3	5	0	0	0	0	0	0	0	0	3	151
14:00	0	188	61	0	12	4	0	0	0	0	2	0	0	9	276
15:00	0	168	53	0	12	0	0	0	0	0	0	0	0	3	236
16:00	0	138	31	0	6	0	0	0	0	0	0	0	0	5	180
17:00	1	144	43	0	6	0	0	0	0	0	0	0	0	2	196
18:00	0	159	41	0	4	0	0	0	0	0	0	0	0	5	209
19:00	0	135	35	0	3	0	0	0	0	0	0	0	0	4	177
20:00	1	67	24	0	4	0	0	0	0	0	0	0	0	2	98
21:00	0	59	16	0	2	0	0	0	0	0	0	0	0	2	79
22:00	0	29	5	0	0	0	0	0	0	0	0	0	0	1	35
23:00	0	7	2	0	0	0	0	0	0	0	0	0	0	0	9
Total	10	2258	643	7	131	4	0	2	0	0	2	0	0	65	3122
Percent	0.3%	72.3%	20.6%	0.2%	4.2%	0.1%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	2.1%	
AM Peak	07:00	07:00	07:00	09:00	07:00			08:00						08:00	
Vol.	2	236	62	2	14			1						6	
PM Peak	13:00	14:00	14:00	13:00	14:00	14:00					14:00			14:00	
Vol.	3	188	61	3	12	4					2			9	
Grand Total	10	2258	643	7	131	4	0	2	0	0	2	0	0	65	3122
Percent	0.3%	72.3%	20.6%	0.2%	4.2%	0.1%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%	2.1%	

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24 Hour Directional Classification Count

JVY001
Site Code: 051-14187

Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
05/08/14	0	13	0	0	2	0	0	0	0	0	0	0	0	0	15
01:00	0	10	2	0	0	0	0	0	0	0	0	0	0	0	12
02:00	0	5	0	0	0	0	0	0	0	0	0	0	0	1	6
03:00	0	4	1	0	0	0	0	0	0	0	0	0	0	0	5
04:00	0	5	2	1	0	0	0	0	0	0	0	0	0	0	8
05:00	0	27	3	1	1	0	0	0	0	0	0	0	0	1	33
06:00	0	56	9	1	6	1	0	0	0	0	0	0	0	1	74
07:00	0	127	29	0	9	0	0	0	0	0	0	0	0	1	166
08:00	0	70	24	1	6	1	0	0	0	0	0	0	0	5	107
09:00	0	89	19	3	9	0	0	0	0	0	0	0	0	0	120
10:00	0	89	33	1	8	0	0	0	0	0	0	0	0	6	137
11:00	0	117	33	1	9	0	0	1	0	0	0	0	0	7	168
12 PM	0	143	24	2	9	0	0	0	0	0	0	0	0	3	181
13:00	2	128	36	2	8	0	0	1	0	0	0	0	0	4	181
14:00	0	174	45	2	5	0	0	0	0	0	0	0	0	6	232
15:00	1	184	38	1	12	0	0	0	0	0	0	0	0	11	247
16:00	0	166	37	1	13	0	0	0	0	0	0	0	0	2	219
17:00	3	191	39	1	6	0	0	0	0	0	0	0	0	4	244
18:00	2	242	51	1	4	0	0	0	0	0	0	0	0	6	306
19:00	0	210	40	1	12	0	0	0	0	0	0	0	0	4	267
20:00	2	181	46	0	7	0	0	1	0	0	0	0	0	6	243
21:00	0	121	14	0	1	0	0	0	0	0	0	0	0	1	137
22:00	0	87	11	0	4	0	0	0	0	0	0	0	0	2	104
23:00	0	44	3	0	1	0	0	0	0	0	0	0	0	1	49
Total	10	2483	539	20	132	2	0	3	0	0	0	0	0	72	3261
Percent	0.3%	76.1%	16.5%	0.6%	4.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	2.2%	
AM Peak		07:00	10:00	09:00	07:00	06:00		11:00						11:00	
Vol.		127	33	3	9	1		1						7	
PM Peak	17:00	18:00	18:00	12:00	16:00			13:00						15:00	
Vol.	3	242	51	2	13			1						11	
Grand Total	10	2483	539	20	132	2	0	3	0	0	0	0	0	72	3261
Percent	0.3%	76.1%	16.5%	0.6%	4.0%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	2.2%	

Counts Unlimited, Inc

PO Box 1178
Corona, CA 92878
Phone: 951-268-6268
email: counts@countsunlimited.com

City of Jurupa Valley
Pats Ranch Road
S/ 65th Street
24 Hour Directional Classification Count

JVY001
Site Code: 051-14187

Northbound, Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
05/08/14	0	21	0	0	3	0	0	0	0	0	0	0	0	0	24
01:00	0	14	3	0	0	0	0	0	0	0	0	0	0	0	17
02:00	0	10	2	0	1	0	0	0	0	0	0	0	0	1	14
03:00	0	11	6	0	0	0	0	0	0	0	0	0	0	0	17
04:00	1	37	16	1	0	0	0	0	0	0	0	0	0	0	55
05:00	0	76	18	1	5	0	0	0	0	0	0	0	0	3	103
06:00	1	147	27	1	12	1	0	0	0	0	0	0	0	5	194
07:00	2	363	91	0	23	0	0	0	0	0	0	0	0	6	485
08:00	0	239	68	1	20	1	0	1	0	0	0	0	0	11	341
09:00	0	210	53	5	18	0	0	0	0	0	0	0	0	2	288
10:00	1	206	69	2	18	0	0	0	0	0	0	0	0	9	305
11:00	0	228	71	1	17	0	0	2	0	0	0	0	0	10	329
12 PM	0	255	52	3	19	0	0	0	0	0	0	0	0	7	336
13:00	5	230	71	5	13	0	0	1	0	0	0	0	0	7	332
14:00	0	362	106	2	17	4	0	0	0	0	2	0	0	15	508
15:00	1	352	91	1	24	0	0	0	0	0	0	0	0	14	483
16:00	0	304	68	1	19	0	0	0	0	0	0	0	0	7	399
17:00	4	335	82	1	12	0	0	0	0	0	0	0	0	6	440
18:00	2	401	92	1	8	0	0	0	0	0	0	0	0	11	515
19:00	0	345	75	1	15	0	0	0	0	0	0	0	0	8	444
20:00	3	248	70	0	11	0	0	1	0	0	0	0	0	8	341
21:00	0	180	30	0	3	0	0	0	0	0	0	0	0	3	216
22:00	0	116	16	0	4	0	0	0	0	0	0	0	0	3	139
23:00	0	51	5	0	1	0	0	0	0	0	0	0	0	1	58
Total	20	4741	1182	27	263	6	0	5	0	0	2	0	0	137	6383
Percent	0.3%	74.3%	18.5%	0.4%	4.1%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	2.1%	
AM Peak	07:00	07:00	07:00	09:00	07:00	06:00		11:00						08:00	
Vol.	2	363	91	5	23	1		2						11	
PM Peak	13:00	18:00	14:00	13:00	15:00	14:00		13:00			14:00			14:00	
Vol.	5	401	106	5	24	4		1			2			15	
Grand Total	20	4741	1182	27	263	6	0	5	0	0	2	0	0	137	6383
Percent	0.3%	74.3%	18.5%	0.4%	4.1%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	2.1%	

APPENDIX 3.2:

EXISTING (2014) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Intersection Level Of Service Report
#86: Hamner Avenue / 68th Street

Control Type:	Signalized	Delay (sec / veh):	37.8
Analysis Method:	HCM2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.501

Intersection Setup

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	280.00	100.00	100.00	250.00	100.00	100.00	200.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Base Volume Input [veh/h]	45	646	151	51	497	38	108	175	76	223	170	78
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	62	0	0	18	0	0	18	0	0	32
Total Hourly Volume [veh/h]	45	646	89	51	497	20	108	175	58	223	170	46
Peak Hour Factor	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	184	25	15	141	6	31	50	16	63	48	13
Total Analysis Volume [veh/h]	51	735	101	58	565	23	123	199	66	254	193	52
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0
All red [s]	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Split [s]	12	34	0	12	34	0	24	34	0	25	35	0
Vehicle Extension [s]	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	L	C	R
L, Total Lost Time per Cycle [s]	5.00	7.00	7.00	5.00	7.00	7.00	5.00	7.00	5.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	5.00	5.00	3.00	5.00	5.00	3.00	5.00	3.00	5.00	5.00
g_i, Effective Green Time [s]	5	37	37	6	37	37	10	20	18	29	29
g / C, Green / Cycle	0.05	0.35	0.35	0.05	0.36	0.36	0.09	0.19	0.17	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.03	0.14	0.14	0.04	0.10	0.10	0.08	0.17	0.16	0.12	0.04
s, saturation flow rate [veh/h]	1597	3192	1550	1597	3192	1636	1597	1606	1597	1676	1425
c, Capacity [veh/h]	82	1128	548	87	1137	583	147	304	278	455	387
d1, Uniform Delay [s]	48.78	25.51	25.55	48.71	24.18	24.20	46.85	41.31	42.54	31.49	28.92
k, delay calibration	0.04	0.50	0.50	0.04	0.50	0.50	0.04	0.24	0.25	0.23	0.23
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.80	1.03	2.16	3.28	0.62	1.21	4.63	15.15	21.53	1.34	0.33
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.62	0.39	0.40	0.67	0.28	0.28	0.83	0.87	0.91	0.42	0.13
d, Delay for Lane Group [s/veh]	51.58	26.54	27.72	51.99	24.80	25.42	51.48	56.46	64.08	32.83	29.25
Lane Group LOS	D	C	C	D	C	C	D	E	E	C	C
Critical Lane Group	no	no	yes	yes	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	1.33	4.12	4.22	1.52	2.80	2.99	3.24	7.65	7.86	4.02	0.99
50th-Percentile Queue Length [ft]	33.34	102.88	105.52	38.11	69.93	74.68	81.05	191.29	196.43	100.60	24.74
95th-Percentile Queue Length [veh]	2.40	7.41	7.59	2.74	5.03	5.38	5.84	12.19	12.45	7.24	1.78
95th-Percentile Queue Length [ft]	60.01	185.19	189.76	68.59	125.87	134.43	145.88	304.70	311.36	181.09	44.54

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.58	26.79	27.72	51.99	24.99	25.42	51.48	56.46	56.46	64.08	32.83	29.25
Movement LOS	D	C	C	D	C	C	D	E	E	E	C	C
d_A, Approach Delay [s/veh]	28.69			27.90			54.88			48.36		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	37.81											
Intersection LOS	D											
Intersection V/C	0.501											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	961	423	577	568	0	0	0	0	118	0	428
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0.0	182.7	182.7	184.5	175.9	0.0				179.2	182.5	182.7
Adj Flow Rate, veh/h	0	991	436	595	586	0				81	0	485
Adj No. of Lanes	0	2	1	2	2	0				1	0	2
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	4	4	3	8	0				6	0	4
Cap, veh/h	0	1630	729	687	2389	0				307	0	554
Arrive On Green	0.00	0.47	0.47	0.07	0.24	0.00				0.18	0.00	0.18
Sat Flow, veh/h	0	3563	1553	3408	3431	0				1707	0	3080
Grp Volume(v), veh/h	0	991	436	595	586	0				81	0	485
Grp Sat Flow(s),veh/h/ln	0	1736	1553	1704	1671	0				1707	0	1540
Q Serve(g_s), s	0.0	22.1	21.6	18.0	14.8	0.0				4.3	0.0	16.0
Cycle Q Clear(g_c), s	0.0	22.1	21.6	18.0	14.8	0.0				4.3	0.0	16.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1630	729	687	2389	0				307	0	554
V/C Ratio(X)	0.00	0.61	0.60	0.87	0.25	0.00				0.26	0.00	0.88
Avail Cap(c_a), veh/h	0	1630	729	1161	2389	0				401	0	724
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.59	0.59	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	20.5	20.4	47.3	17.0	0.0				36.8	0.0	41.6
Incr Delay (d2), s/veh	0.0	0.5	0.9	1.0	0.1	0.0				0.2	0.0	7.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.6	9.4	8.6	6.9	0.0				2.0	0.0	7.4
LnGrp Delay(d),s/veh	0.0	21.0	21.3	48.3	17.2	0.0				37.0	0.0	49.5
LnGrp LOS		C	C	D	B					D		D
Approach Vol, veh/h		1427			1181						566	
Approach Delay, s/veh		21.1			32.8						47.7	
Approach LOS		C			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	25.5	54.5		24.3		80.0		
Change Period (Y+Rc), s	4.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	35.5	34.5		24.5		74.5		
Max Q Clear Time (g_c+I1), s	20.0	24.1		18.0		16.8		
Green Ext Time (p_c), s	1.0	5.5		0.8		9.3		

Intersection Summary	
HCM 2010 Ctrl Delay	30.2
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	666	413	0	0	940	321	205	2	272	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	182.7	179.2	0.0	0.0	181.0	182.7	174.3	179.4	181.0			
Adj Flow Rate, veh/h	716	444	0	0	1011	345	323	0	183			
Adj No. of Lanes	2	2	0	0	2	1	2	0	1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	4	6	0	0	5	4	9	0	5			
Cap, veh/h	815	2307	0	0	1358	611	740	0	343			
Arrive On Green	0.24	0.68	0.00	0.00	0.40	0.40	0.22	0.00	0.22			
Sat Flow, veh/h	3375	3495	0	0	3529	1547	3320	0	1538			
Grp Volume(v), veh/h	716	444	0	0	1011	345	323	0	183			
Grp Sat Flow(s),veh/h/ln	1688	1703	0	0	1719	1547	1660	0	1538			
Q Serve(g_s), s	22.5	5.3	0.0	0.0	27.7	19.1	9.2	0.0	11.5			
Cycle Q Clear(g_c), s	22.5	5.3	0.0	0.0	27.7	19.1	9.2	0.0	11.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	815	2307	0	0	1358	611	740	0	343			
V/C Ratio(X)	0.88	0.19	0.00	0.00	0.74	0.56	0.44	0.00	0.53			
Avail Cap(c_a), veh/h	1089	2307	0	0	1358	611	740	0	343			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.76	0.76	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	40.2	6.6	0.0	0.0	28.5	25.9	36.8	0.0	37.7			
Incr Delay (d2), s/veh	5.2	0.1	0.0	0.0	3.7	3.7	1.9	0.0	5.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	11.0	2.5	0.0	0.0	13.8	8.8	4.4	0.0	5.4			
LnGrp Delay(d),s/veh	45.3	6.7	0.0	0.0	32.3	29.7	38.7	0.0	43.6			
LnGrp LOS	D	A			C	C	D		D			
Approach Vol, veh/h		1160			1356			506				
Approach Delay, s/veh		30.6			31.6			40.5				
Approach LOS		C			C			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		80.0			31.0	49.0		30.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.5
Max Green Setting (Gmax), s		74.5			35.5	34.5		24.5
Max Q Clear Time (g_c+I1), s		7.3			24.5	29.7		13.5
Green Ext Time (p_c), s		8.1			2.1	2.9		1.4

Intersection Summary	
HCM 2010 Ctrl Delay	32.7
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Intersection Level Of Service Report
#89: Pats Ranch Road / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	10.5
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.432

Intersection Setup

Name	Pats Ranch Road		Limonite Avenue		Limonite Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	210.00	100.00	100.00	100.00	170.00	100.00
Speed [mph]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	yes		no		no	

Volumes

Name	Pats Ranch Road		Limonite Avenue		Limonite Avenue	
Base Volume Input [veh/h]	328	49	600	90	55	933
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	35	0	42	0	0
Total Hourly Volume [veh/h]	328	14	600	48	55	933
Peak Hour Factor	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	89	4	163	13	15	253
Total Analysis Volume [veh/h]	356	15	651	52	60	1013
Presence of On-Street Parking	no	no	no	no	no	no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Protected	Permissive
Signal Group	3	0	2	0	1	6
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	6	0	6	0	5	6
Maximum Green [s]	0	0	0	0	0	0
Amber [s]	3.6	0.0	4.7	0.0	3.2	4.7
All red [s]	1.0	0.0	1.0	0.0	1.0	1.0
Split [s]	15	0	30	0	15	45
Vehicle Extension [s]	2.5	0.0	3.0	0.0	1.5	3.0
Walk [s]	0	0	11	0	0	0
Pedestrian Clearance [s]	0	0	13	0	0	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.6	0.0	3.7	0.0	2.2	3.7
Minimum Recall	no		no		no	no
Maximum Recall	no		yes		no	yes
Pedestrian Recall	no		no		no	no
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	R	C	R	L	C
L, Total Lost Time per Cycle [s]	4.60	4.60	5.70	5.70	4.20	5.70
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	3.70	3.70	2.20	3.70
g_i, Effective Green Time [s]	9	9	34	34	3	41
g / C, Green / Cycle	0.15	0.15	0.56	0.56	0.05	0.68
(v / s)_i Volume / Saturation Flow Rate	0.11	0.01	0.20	0.04	0.04	0.32
s, saturation flow rate [veh/h]	3101	1425	3192	1425	1597	3192
c, Capacity [veh/h]	450	207	1790	799	83	2180
d1, Uniform Delay [s]	24.70	22.10	7.25	5.99	27.93	4.41
k, delay calibration	0.08	0.08	0.50	0.50	0.04	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.38	0.11	0.57	0.16	4.38	0.71
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

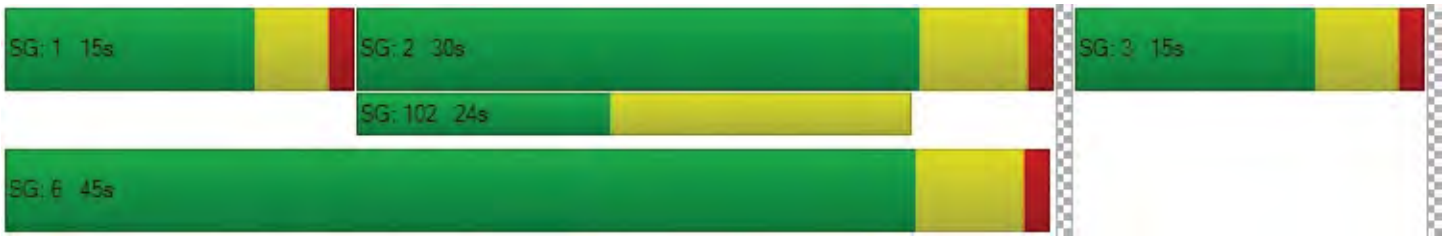
X, volume / capacity	0.79	0.07	0.36	0.07	0.72	0.46
d, Delay for Lane Group [s/veh]	27.09	22.21	7.83	6.15	32.32	5.12
Lane Group LOS	C	C	A	A	C	A
Critical Lane Group	yes	no	no	no	no	yes
50th-Percentile Queue Length [veh]	2.38	0.17	1.68	0.24	0.86	1.49
50th-Percentile Queue Length [ft]	59.55	4.37	41.98	5.94	21.55	37.34
95th-Percentile Queue Length [veh]	4.29	0.31	3.02	0.43	1.55	2.69
95th-Percentile Queue Length [ft]	107.19	7.86	75.56	10.69	38.79	67.21

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	27.09	22.21	7.83	6.15	32.32	5.12
Movement LOS	C	C	A	A	C	A
d_A, Approach Delay [s/veh]	26.89		7.70		6.64	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	10.49					
Intersection LOS	B					
Intersection V/C	0.432					

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
#90: Pats Ranch Road / 65th Street

Control Type:	Signalized	Delay (sec / veh):	12.5
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.160

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	90.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Base Volume Input [veh/h]	44	246	30	7	119	0	19	5	19	41	6	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	3	0	0	0	0	0	16	0	0	24
Total Hourly Volume [veh/h]	44	246	27	7	119	0	19	5	3	41	6	9
Peak Hour Factor	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	75	8	2	36	0	6	2	1	12	2	3
Total Analysis Volume [veh/h]	53	299	33	8	144	0	23	6	4	50	7	11
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	0	1	6	0	0	4	0	0	8	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.6	3.6	0.0	3.6	3.6	0.0	0.0	3.6	0.0	0.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	16	27	0	16	27	0	0	27	0	0	27	0
Vehicle Extension [s]	2.5	2.5	0.0	2.5	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	15	0	0	15	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.6	2.6	0.0	2.6	2.6	0.0	0.0	2.6	0.0	0.0	2.6	0.0
Minimum Recall	no	no		no	no			no			no	
Maximum Recall	no	yes		no	yes			no			no	
Pedestrian Recall	no	no		no	no			no			no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	4	50	50	1	46	46	5	5	5	5
g / C, Green / Cycle	0.06	0.71	0.71	0.01	0.66	0.66	0.08	0.08	0.08	0.08
(v / s)_i Volume / Saturation Flow Rate	0.03	0.08	0.08	0.01	0.05	0.00	0.02	0.01	0.08	0.01
s, saturation flow rate [veh/h]	1597	1676	1603	1597	3192	1425	1263	1566	753	1425
c, Capacity [veh/h]	102	1196	1143	23	2118	946	103	118	153	107
d1, Uniform Delay [s]	31.68	3.12	3.12	34.13	4.14	0.00	34.95	30.08	33.18	30.12
k, delay calibration	0.08	0.50	0.50	0.08	0.50	0.50	0.08	0.08	0.08	0.08
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.03	0.19	0.20	6.74	0.06	0.00	0.80	0.23	1.11	0.31
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.52	0.11	0.11	0.35	0.07	0.00	0.22	0.08	0.37	0.10
d, Delay for Lane Group [s/veh]	34.71	3.30	3.32	40.87	4.20	0.00	35.75	30.31	34.29	30.43
Lane Group LOS	C	A	A	D	A	A	D	C	C	C
Critical Lane Group	no	no	yes	yes	no	no	no	no	yes	no
50th-Percentile Queue Length [veh]	0.91	0.41	0.41	0.17	0.28	0.00	0.42	0.16	1.00	0.18
50th-Percentile Queue Length [ft]	22.80	10.36	10.15	4.29	6.96	0.00	10.38	4.03	24.88	4.47
95th-Percentile Queue Length [veh]	1.64	0.75	0.73	0.31	0.50	0.00	0.75	0.29	1.79	0.32
95th-Percentile Queue Length [ft]	41.04	18.65	18.27	7.72	12.53	0.00	18.68	7.26	44.78	8.04

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.71	3.31	3.32	40.87	4.20	0.00	35.75	30.31	30.31	34.29	34.29	30.43
Movement LOS	C	A	A	D	A	A	D	C	C	C	C	C
d_A, Approach Delay [s/veh]	8.66			6.13			34.10			33.67		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	12.48											
Intersection LOS	B											
Intersection V/C	0.160											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
#92: Pats Ranch Road / Ivory Street

Control Type:	Two-way stop	Delay (sec / veh):	16.3
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.251

Intersection Setup

Name	Pats Ranch Road		Pats Ranch Road		Ivory Street	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	200.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		yes	

Volumes

Name	Pats Ranch Road		Pats Ranch Road		Ivory Street	
Base Volume Input [veh/h]	237	48	33	146	72	83
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	237	48	33	146	72	83
Peak Hour Factor	0.6820	0.6820	0.6820	0.6820	0.6820	0.6820
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	87	18	12	54	26	30
Total Analysis Volume [veh/h]	348	70	48	214	106	122
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			no
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.04	0.00	0.25	0.15
d_M, Delay for Movement [s/veh]	0.00	0.00	8.30	0.00	16.35	10.33
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	0.00	0.00	0.13	0.00	0.98	0.54
95th-Percentile Queue Length [ft]	0.00	0.00	3.30	0.00	24.50	13.47
d_A, Approach Delay [s/veh]	0.00		1.52		13.13	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	3.74					
Intersection LOS	C					

Intersection Level Of Service Report
#93: Pats Ranch Road / 68th Street

Control Type:	All-way stop	Delay (sec / veh):	48.1
Analysis Method:	HCM2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name	Pats Ranch Road		68th Street		68th Street	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1
Pocket Length [ft]	100.00	100.00	200.00	100.00	100.00	220.00
Speed [mph]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	yes		no		no	

Volumes

Name	Pats Ranch Road		68th Street		68th Street	
Base Volume Input [veh/h]	25	193	250	407	379	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	193	250	407	379	35
Peak Hour Factor	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	65	85	138	128	12
Total Analysis Volume [veh/h]	34	261	338	551	513	47
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

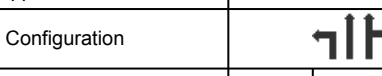
Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.27	3.40	6.00	18.63	3.32	3.32	0.30
95th-Percentile Queue Length [ft]	6.87	85.05	150.05	465.66	82.91	82.91	7.62
Approach Delay [s/veh]	19.11		75.98		19.01		
Approach LOS	C		F		C		
Intersection Delay [s/veh]	48.07						
Intersection LOS	E						

Intersection Level Of Service Report
#94: Wineville Avenue / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	22.0
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.370

Intersection Setup

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Pocket Length [ft]	185.00	100.00	100.00	100.00	100.00	100.00	250.00	100.00	360.00	245.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Base Volume Input [veh/h]	56	105	46	40	77	120	69	532	48	26	812	29
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	24	0	0	0
Total Hourly Volume [veh/h]	56	105	46	40	77	120	69	532	24	26	812	29
Peak Hour Factor	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	28	12	11	21	32	18	142	6	7	216	8
Total Analysis Volume [veh/h]	60	112	49	43	82	128	74	567	26	28	866	31
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	26.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	5	0	4	5	0	4	6	0	4	6	0
Maximum Green [s]	37	58	0	37	58	0	20	0	0	75	0	0
Amber [s]	3.0	4.3	0.0	3.0	4.3	0.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0
Split [s]	35	38	0	24	27	0	10	30	0	8	28	0
Vehicle Extension [s]	1.5	2.0	0.0	1.5	2.0	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Walk [s]	0	5	0	0	5	0	0	10	0	0	10	0
Pedestrian Clearance [s]	0	21	0	0	16	0	0	13	0	0	12	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	1.5	3.3	0.0	1.5	3.3	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	no		no	no		no	yes		no	yes	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	L	C	R	L	C	C
L, Total Lost Time per Cycle [s]	3.50	5.30	5.30	3.50	5.30	3.50	6.00	6.00	3.50	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.50	3.30	3.30	1.50	3.30	1.50	4.00	4.00	1.50	4.00	4.00
g_i, Effective Green Time [s]	4	16	16	3	14	5	61	61	2	58	58
g / C, Green / Cycle	0.04	0.16	0.16	0.03	0.14	0.05	0.61	0.61	0.02	0.58	0.58
(v / s)_i Volume / Saturation Flow Rate	0.03	0.04	0.04	0.02	0.12	0.04	0.16	0.02	0.02	0.17	0.17
s, saturation flow rate [veh/h]	1774	1863	1663	1774	1682	1774	3547	1583	1774	1863	1830
c, Capacity [veh/h]	78	293	262	56	243	95	2150	960	40	1071	1052
d1, Uniform Delay [s]	47.33	37.04	37.14	48.13	41.85	46.76	9.24	7.89	48.59	10.89	10.89
k, delay calibration	0.04	0.04	0.04	0.04	0.04	0.06	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.76	0.17	0.21	8.24	3.57	7.31	0.30	0.05	8.11	0.70	0.71
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.77	0.26	0.27	0.77	0.86	0.78	0.26	0.03	0.70	0.29	0.29
d, Delay for Lane Group [s/veh]	53.09	37.21	37.35	56.37	45.42	54.07	9.54	7.94	56.70	11.59	11.60
Lane Group LOS	D	D	D	E	D	D	A	A	E	B	B
Critical Lane Group	yes	no	no	no	yes	yes	no	no	no	no	yes
50th-Percentile Queue Length [veh]	1.55	1.57	1.51	1.16	5.09	1.95	2.57	0.21	0.75	3.16	3.11
50th-Percentile Queue Length [ft]	38.85	39.33	37.66	28.91	127.31	48.74	64.29	5.21	18.71	78.95	77.68
95th-Percentile Queue Length [veh]	2.80	2.83	2.71	2.08	8.79	3.51	4.63	0.38	1.35	5.68	5.59
95th-Percentile Queue Length [ft]	69.92	70.79	67.80	52.05	219.83	87.72	115.72	9.38	33.68	142.11	139.82

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	53.09	37.24	37.35	56.37	45.42	45.42	54.07	9.54	7.94	56.70	11.60	11.60
Movement LOS	D	D	D	E	D	D	D	A	A	E	B	B
d_A, Approach Delay [s/veh]	41.86			47.28			14.42			13.53		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	21.96											
Intersection LOS	C											
Intersection V/C	0.370											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
#86: Hamner Avenue / 68th Street

Control Type:	Signalized	Delay (sec / veh):	28.8
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.369

Intersection Setup

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	280.00	100.00	100.00	250.00	100.00	100.00	200.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Base Volume Input [veh/h]	49	631	182	45	537	71	56	91	38	157	143	72
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	72	0	0	16	0	0	10	0	0	38
Total Hourly Volume [veh/h]	49	631	110	45	537	55	56	91	28	157	143	34
Peak Hour Factor	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	178	31	13	152	16	16	26	8	44	40	10
Total Analysis Volume [veh/h]	55	713	124	51	607	62	63	103	32	177	162	38
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0
All red [s]	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Split [s]	12	34	0	12	34	0	17	34	0	20	37	0
Vehicle Extension [s]	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	L	C	R
L, Total Lost Time per Cycle [s]	5.00	7.00	7.00	5.00	7.00	7.00	5.00	7.00	5.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	5.00	5.00	3.00	5.00	5.00	3.00	5.00	3.00	5.00	5.00
g_i, Effective Green Time [s]	5	47	47	5	47	47	6	11	13	18	18
g / C, Green / Cycle	0.05	0.47	0.47	0.05	0.47	0.47	0.06	0.11	0.13	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.03	0.14	0.14	0.03	0.11	0.11	0.04	0.08	0.11	0.10	0.03
s, saturation flow rate [veh/h]	1597	3192	1523	1597	3192	1580	1597	1609	1597	1676	1425
c, Capacity [veh/h]	87	1515	723	84	1509	747	92	169	203	293	249
d1, Uniform Delay [s]	46.25	16.05	16.08	46.30	15.64	15.67	46.19	43.66	42.82	37.67	34.96
k, delay calibration	0.04	0.50	0.50	0.04	0.50	0.50	0.04	0.23	0.15	0.23	0.23
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.77	0.50	1.07	2.57	0.37	0.76	3.31	16.32	14.23	3.46	0.60
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

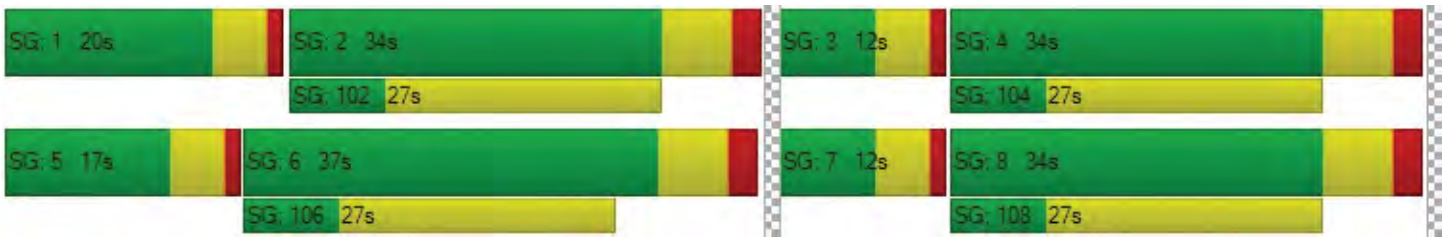
X, volume / capacity	0.63	0.30	0.30	0.60	0.24	0.24	0.68	0.80	0.87	0.55	0.15
d, Delay for Lane Group [s/veh]	49.02	16.55	17.15	48.87	16.01	16.43	49.50	59.98	57.05	41.13	35.56
Lane Group LOS	D	B	B	D	B	B	D	E	E	D	D
Critical Lane Group	no	no	yes	yes	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	1.36	2.99	3.01	1.26	2.32	2.41	1.57	3.90	4.91	3.75	0.80
50th-Percentile Queue Length [ft]	33.98	74.71	75.26	31.45	57.92	60.33	39.17	97.58	122.87	93.71	19.91
95th-Percentile Queue Length [veh]	2.45	5.38	5.42	2.26	4.17	4.34	2.82	7.03	8.55	6.75	1.43
95th-Percentile Queue Length [ft]	61.17	134.47	135.46	56.61	104.26	108.59	70.51	175.64	213.76	168.68	35.84

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	49.02	16.65	17.15	48.87	16.12	16.43	49.50	59.98	59.98	57.05	41.13	35.56
Movement LOS	D	B	B	D	B	B	D	E	E	E	D	D
d_A, Approach Delay [s/veh]	19.21			18.98			56.65			48.04		
Approach LOS	B			B			E			D		
d_I, Intersection Delay [s/veh]	28.83											
Intersection LOS	C											
Intersection V/C	0.369											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
#90: Pats Ranch Road / 65th Street

Control Type:	Signalized	Delay (sec / veh):	12.3
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.209

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	90.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Base Volume Input [veh/h]	50	184	23	34	202	5	22	2	24	18	7	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	18	0	0	18
Total Hourly Volume [veh/h]	50	184	23	34	202	5	22	2	6	18	7	3
Peak Hour Factor	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	61	8	11	67	2	7	1	2	6	2	1
Total Analysis Volume [veh/h]	66	244	31	45	268	7	29	3	8	24	9	4
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	0	1	6	0	0	4	0	0	8	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.6	3.6	0.0	3.6	3.6	0.0	0.0	3.6	0.0	0.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	12	27	0	12	27	0	0	31	0	0	31	0
Vehicle Extension [s]	2.5	2.5	0.0	2.5	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	15	0	0	15	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.6	2.6	0.0	2.6	2.6	0.0	0.0	2.6	0.0	0.0	2.6	0.0
Minimum Recall	no	no		no	no			no			no	
Maximum Recall	no	yes		no	yes			no			no	
Pedestrian Recall	no	no		no	no			no			no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	5	48	48	4	48	48	4	4	4	4
g / C, Green / Cycle	0.07	0.69	0.69	0.06	0.68	0.68	0.05	0.05	0.05	0.05
(v / s)_i Volume / Saturation Flow Rate	0.04	0.07	0.07	0.03	0.08	0.00	0.02	0.01	0.08	0.00
s, saturation flow rate [veh/h]	1597	1676	1599	1597	3192	1425	1260	1486	396	1425
c, Capacity [veh/h]	114	1164	1110	92	2172	970	103	75	109	72
d1, Uniform Delay [s]	31.38	3.50	3.51	31.90	3.89	3.58	34.89	31.69	34.45	31.55
k, delay calibration	0.08	0.50	0.50	0.08	0.50	0.50	0.08	0.08	0.08	0.08
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.42	0.17	0.18	2.99	0.12	0.01	1.08	0.66	1.14	0.24
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

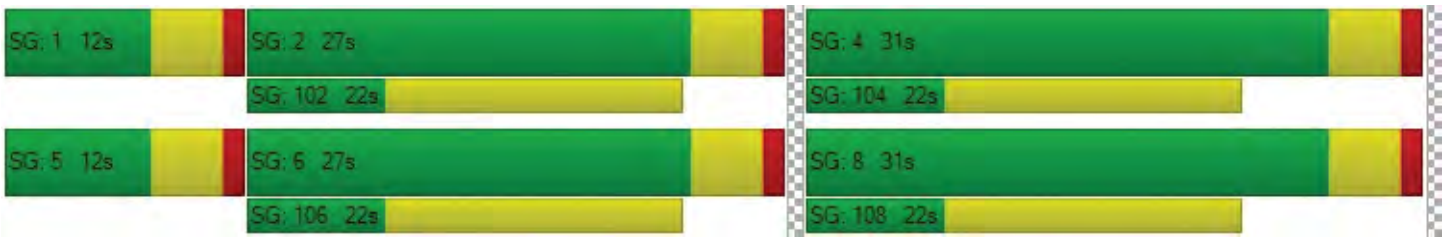
X, volume / capacity	0.58	0.10	0.10	0.49	0.12	0.01	0.28	0.15	0.30	0.06
d, Delay for Lane Group [s/veh]	34.81	3.67	3.69	34.89	4.01	3.59	35.97	32.35	35.59	31.78
Lane Group LOS	C	A	A	C	A	A	D	C	D	C
Critical Lane Group	yes	no	no	no	yes	no	no	no	yes	no
50th-Percentile Queue Length [veh]	1.13	0.41	0.40	0.78	0.49	0.03	0.53	0.19	0.59	0.07
50th-Percentile Queue Length [ft]	28.37	10.19	9.99	19.48	12.23	0.64	13.20	4.71	14.79	1.70
95th-Percentile Queue Length [veh]	2.04	0.73	0.72	1.40	0.88	0.05	0.95	0.34	1.06	0.12
95th-Percentile Queue Length [ft]	51.07	18.34	17.98	35.07	22.01	1.15	23.77	8.48	26.61	3.06

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.81	3.68	3.69	34.89	4.01	3.59	35.97	32.35	32.35	35.59	35.59	31.78
Movement LOS	C	A	A	C	A	A	D	C	C	D	D	C
d_A, Approach Delay [s/veh]	10.66			8.34			34.98			35.18		
Approach LOS	B			A			C			D		
d_I, Intersection Delay [s/veh]	12.30											
Intersection LOS	B											
Intersection V/C	0.209											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
#92: Pats Ranch Road / Ivory Street

Control Type:	Two-way stop	Delay (sec / veh):	16.4
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.236

Intersection Setup

Name	Pats Ranch Road		Pats Ranch Road		Ivory Street	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	200.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		yes	

Volumes

Name	Pats Ranch Road		Pats Ranch Road		Ivory Street	
Base Volume Input [veh/h]	165	63	49	195	64	92
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	165	63	49	195	64	92
Peak Hour Factor	0.6630	0.6630	0.6630	0.6630	0.6630	0.6630
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	62	24	18	74	24	35
Total Analysis Volume [veh/h]	249	95	74	294	97	139
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			no
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.06	0.00	0.24	0.17
d_M, Delay for Movement [s/veh]	0.00	0.00	8.16	0.00	16.44	10.12
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	0.00	0.00	0.19	0.00	0.91	0.59
95th-Percentile Queue Length [ft]	0.00	0.00	4.87	0.00	22.64	14.74
d_A, Approach Delay [s/veh]	0.00		1.64		12.72	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	3.80					
Intersection LOS	C					

Intersection Level Of Service Report
#93: Pats Ranch Road / 68th Street

Control Type:	All-way stop	Delay (sec / veh):	23.3
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Pats Ranch Road		68th Street		68th Street	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1
Pocket Length [ft]	100.00	100.00	200.00	100.00	100.00	220.00
Speed [mph]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	yes		no		no	

Volumes

Name	Pats Ranch Road		68th Street		68th Street	
Base Volume Input [veh/h]	28	231	187	253	307	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	231	187	253	307	41
Peak Hour Factor	0.6780	0.6780	0.6780	0.6780	0.6780	0.6780
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	85	69	93	113	15
Total Analysis Volume [veh/h]	41	341	276	373	453	60
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.32	5.31	4.04	6.93	2.68	2.68	0.40
95th-Percentile Queue Length [ft]	8.01	132.83	101.08	173.33	67.04	67.04	10.05
Approach Delay [s/veh]	23.67		28.03		17.14		
Approach LOS	C		D		C		
Intersection Delay [s/veh]	23.33						
Intersection LOS	C						

Intersection Level Of Service Report
#86: Hamner Avenue / 68th Street

Control Type:	Signalized	Delay (sec / veh):	29.7
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.385

Intersection Setup

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	280.00	100.00	100.00	250.00	100.00	100.00	200.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Base Volume Input [veh/h]	69	636	188	96	561	60	56	106	34	161	129	76
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	77	0	0	34	0	0	11	0	0	38
Total Hourly Volume [veh/h]	69	636	111	96	561	26	56	106	23	161	129	38
Peak Hour Factor	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	165	29	25	146	7	15	28	6	42	33	10
Total Analysis Volume [veh/h]	72	660	115	100	583	27	58	110	24	167	134	39
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0
All red [s]	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Split [s]	12	34	0	12	34	0	18	35	0	19	36	0
Vehicle Extension [s]	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	L	C	R
L, Total Lost Time per Cycle [s]	5.00	7.00	7.00	5.00	7.00	7.00	5.00	7.00	5.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	5.00	5.00	3.00	5.00	5.00	3.00	5.00	3.00	5.00	5.00
g_i, Effective Green Time [s]	6	46	46	8	47	47	6	10	12	17	17
g / C, Green / Cycle	0.06	0.46	0.46	0.08	0.47	0.47	0.06	0.10	0.12	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.05	0.13	0.14	0.06	0.11	0.11	0.04	0.08	0.10	0.08	0.03
s, saturation flow rate [veh/h]	1597	3192	1527	1597	3192	1633	1597	1625	1597	1676	1425
c, Capacity [veh/h]	96	1464	700	122	1516	776	89	169	193	283	241
d1, Uniform Delay [s]	46.20	16.90	16.94	45.45	15.48	15.50	46.22	43.73	43.14	37.52	35.49
k, delay calibration	0.04	0.50	0.50	0.04	0.50	0.50	0.04	0.23	0.15	0.23	0.23
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.25	0.50	1.07	4.99	0.36	0.70	2.95	16.16	14.24	2.62	0.67
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

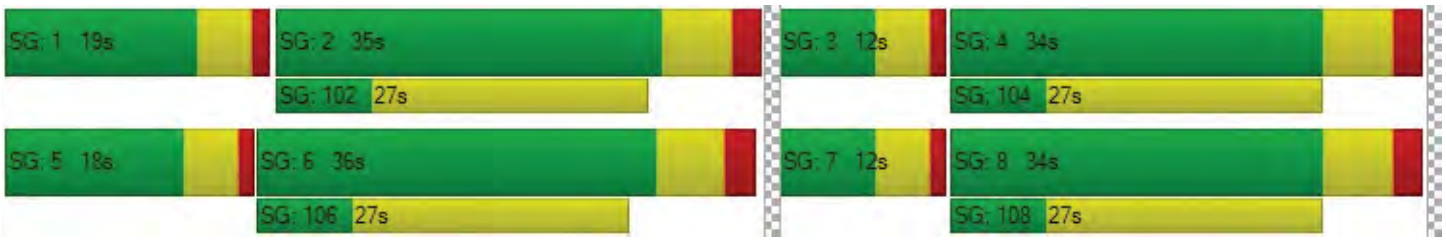
X, volume / capacity	0.75	0.29	0.30	0.82	0.23	0.23	0.65	0.79	0.87	0.47	0.16
d, Delay for Lane Group [s/veh]	50.45	17.40	18.01	50.44	15.84	16.20	49.17	59.89	57.38	40.14	36.16
Lane Group LOS	D	B	B	D	B	B	D	E	E	D	D
Critical Lane Group	no	no	yes	yes	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	1.81	2.92	2.96	2.52	2.25	2.40	1.44	3.87	4.65	3.05	0.83
50th-Percentile Queue Length [ft]	45.30	73.06	73.91	63.10	56.31	59.93	35.91	96.76	116.23	76.14	20.66
95th-Percentile Queue Length [veh]	3.26	5.26	5.32	4.54	4.05	4.31	2.59	6.97	8.19	5.48	1.49
95th-Percentile Queue Length [ft]	81.55	131.52	133.04	113.59	101.36	107.87	64.63	174.16	204.63	137.06	37.20

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	50.45	17.51	18.01	50.44	15.95	16.20	49.17	59.89	59.89	57.38	40.14	36.16
Movement LOS	D	B	B	D	B	B	D	E	E	E	D	D
d_A, Approach Delay [s/veh]	20.96			21.42			56.65			48.15		
Approach LOS	C			C			E			D		
d_I, Intersection Delay [s/veh]	29.73											
Intersection LOS	C											
Intersection V/C	0.385											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1073	441	415	857	0	0	0	0	216	1	539
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0.0	186.3	186.3	188.1	186.3	0.0				186.3	186.3	186.3
Adj Flow Rate, veh/h	0	1129	464	437	902	0				152	0	648
Adj No. of Lanes	0	2	1	2	2	0				1	0	2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	1	2	0				2	0	2
Cap, veh/h	0	1728	773	520	2402	0				392	0	696
Arrive On Green	0.00	0.49	0.49	0.05	0.22	0.00				0.22	0.00	0.22
Sat Flow, veh/h	0	3632	1583	3476	3632	0				1774	0	3145
Grp Volume(v), veh/h	0	1129	464	437	902	0				152	0	648
Grp Sat Flow(s),veh/h/ln	0	1770	1583	1738	1770	0				1774	0	1573
Q Serve(g_s), s	0.0	26.3	23.3	13.7	23.7	0.0				8.0	0.0	22.2
Cycle Q Clear(g_c), s	0.0	26.3	23.3	13.7	23.7	0.0				8.0	0.0	22.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1728	773	520	2402	0				392	0	696
V/C Ratio(X)	0.00	0.65	0.60	0.84	0.38	0.00				0.39	0.00	0.93
Avail Cap(c_a), veh/h	0	1728	773	1124	2402	0				396	0	702
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.71	0.71	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	21.1	20.3	50.9	22.9	0.0				36.4	0.0	41.9
Incr Delay (d2), s/veh	0.0	0.7	0.9	1.0	0.3	0.0				0.2	0.0	18.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.0	10.4	6.7	11.7	0.0				4.0	0.0	11.4
LnGrp Delay(d),s/veh	0.0	21.8	21.3	51.9	23.2	0.0				36.6	0.0	60.7
LnGrp LOS		C	C	D	C					D		E
Approach Vol, veh/h		1593			1339						800	
Approach Delay, s/veh		21.7			32.6						56.2	
Approach LOS		C			C						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	20.9	59.1		29.8		80.0		
Change Period (Y+Rc), s	4.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	35.5	34.5		24.5		74.5		
Max Q Clear Time (g_c+I1), s	15.7	28.3		24.2		25.7		
Green Ext Time (p_c), s	0.7	4.5		0.1		13.8		

Intersection Summary	
HCM 2010 Ctrl Delay	33.0
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	404	885	0	0	940	242	332	17	601	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	184.5	186.3	0.0	0.0	188.1	188.1	186.3	188.0	188.1			
Adj Flow Rate, veh/h	421	922	0	0	979	252	237	0	755			
Adj No. of Lanes	2	2	0	0	2	1	1	0	2			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	2	0	0	1	1	2	0	1			
Cap, veh/h	512	2397	0	0	1737	775	395	0	712			
Arrive On Green	0.15	0.68	0.00	0.00	0.49	0.49	0.22	0.00	0.22			
Sat Flow, veh/h	3408	3632	0	0	3668	1594	1774	0	3198			
Grp Volume(v), veh/h	421	922	0	0	979	252	237	0	755			
Grp Sat Flow(s),veh/h/ln	1704	1770	0	0	1787	1594	1774	0	1599			
Q Serve(g_s), s	13.2	12.5	0.0	0.0	21.3	10.6	13.2	0.0	24.5			
Cycle Q Clear(g_c), s	13.2	12.5	0.0	0.0	21.3	10.6	13.2	0.0	24.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	512	2397	0	0	1737	775	395	0	712			
V/C Ratio(X)	0.82	0.38	0.00	0.00	0.56	0.33	0.60	0.00	1.06			
Avail Cap(c_a), veh/h	1100	2397	0	0	1737	775	395	0	712			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.71	0.71	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	45.3	7.7	0.0	0.0	20.0	17.3	38.4	0.0	42.8			
Incr Delay (d2), s/veh	2.4	0.3	0.0	0.0	1.3	1.1	6.6	0.0	50.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.4	6.1	0.0	0.0	10.8	4.9	7.2	0.0	15.8			
LnGrp Delay(d),s/veh	47.7	8.1	0.0	0.0	21.3	18.4	44.9	0.0	93.5			
LnGrp LOS	D	A			C	B	D		F			
Approach Vol, veh/h		1343			1231			992				
Approach Delay, s/veh		20.5			20.7			81.9				
Approach LOS		C			C			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		80.0			21.0	59.0		30.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.5
Max Green Setting (Gmax), s		74.5			35.5	34.5		24.5
Max Q Clear Time (g_c+I1), s		14.5			15.2	23.3		26.5
Green Ext Time (p_c), s		11.5			1.4	6.4		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	37.7
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Intersection Level Of Service Report
#89: Pats Ranch Road / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	15.1
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.598

Intersection Setup

Name	Pats Ranch Road		Limonite Avenue		Limonite Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	210.00	100.00	100.00	100.00	170.00	100.00
Speed [mph]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	yes		no		no	

Volumes

Name	Pats Ranch Road		Limonite Avenue		Limonite Avenue	
Base Volume Input [veh/h]	302	151	1039	229	218	880
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	64	0	87	0	0
Total Hourly Volume [veh/h]	302	87	1039	142	218	880
Peak Hour Factor	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	81	23	278	38	58	235
Total Analysis Volume [veh/h]	323	93	1110	152	233	940
Presence of On-Street Parking	no	no	no	no	no	no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Protected	Permissive
Signal Group	3	0	2	0	1	6
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	6	0	6	0	5	6
Maximum Green [s]	0	0	0	0	0	0
Amber [s]	3.6	0.0	4.7	0.0	3.2	4.7
All red [s]	1.0	0.0	1.0	0.0	1.0	1.0
Split [s]	12	0	30	0	18	48
Vehicle Extension [s]	2.5	0.0	3.0	0.0	1.5	3.0
Walk [s]	0	0	11	0	0	0
Pedestrian Clearance [s]	0	0	13	0	0	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.6	0.0	3.7	0.0	2.2	3.7
Minimum Recall	no		no		no	no
Maximum Recall	no		yes		no	yes
Pedestrian Recall	no		no		no	no
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	R	C	R	L	C
L, Total Lost Time per Cycle [s]	4.60	4.60	5.70	5.70	4.20	5.70
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	3.70	3.70	2.20	3.70
g_i, Effective Green Time [s]	7	7	28	28	10	42
g / C, Green / Cycle	0.12	0.12	0.46	0.46	0.17	0.70
(v / s)_i Volume / Saturation Flow Rate	0.10	0.07	0.35	0.11	0.15	0.29
s, saturation flow rate [veh/h]	3101	1425	3192	1425	1597	3192
c, Capacity [veh/h]	382	175	1483	662	272	2250
d1, Uniform Delay [s]	25.71	24.64	13.16	9.61	24.15	3.70
k, delay calibration	0.08	0.08	0.50	0.50	0.08	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.93	1.84	3.50	0.81	6.03	0.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

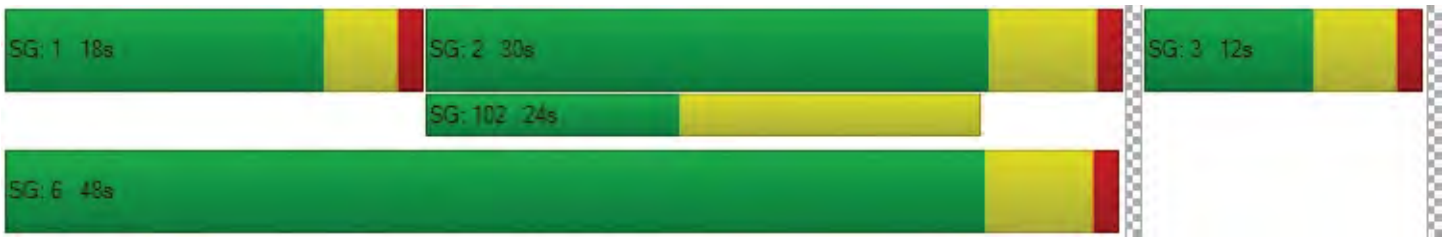
X, volume / capacity	0.85	0.53	0.75	0.23	0.86	0.42
d, Delay for Lane Group [s/veh]	29.65	26.48	16.66	10.42	30.18	4.27
Lane Group LOS	C	C	B	B	C	A
Critical Lane Group	yes	no	yes	no	yes	no
50th-Percentile Queue Length [veh]	2.28	1.23	5.29	1.06	3.25	1.08
50th-Percentile Queue Length [ft]	57.01	30.82	132.14	26.53	81.22	26.93
95th-Percentile Queue Length [veh]	4.10	2.22	9.06	1.91	5.85	1.94
95th-Percentile Queue Length [ft]	102.61	55.48	226.40	47.76	146.19	48.47

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	29.65	26.48	16.66	10.42	30.18	4.27
Movement LOS	C	C	B	B	C	A
d_A, Approach Delay [s/veh]	28.94		15.91		9.42	
Approach LOS	C		B		A	
d_I, Intersection Delay [s/veh]	15.14					
Intersection LOS	B					
Intersection V/C	0.598					

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
#90: Pats Ranch Road / 65th Street

Control Type:	Signalized	Delay (sec / veh):	15.5
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.200

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	90.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Base Volume Input [veh/h]	81	114	10	51	250	8	34	6	27	7	22	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	15	0	0	14
Total Hourly Volume [veh/h]	81	114	10	51	250	8	34	6	12	7	22	5
Peak Hour Factor	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	33	3	15	73	2	10	2	3	2	6	1
Total Analysis Volume [veh/h]	94	133	12	59	291	9	40	7	14	8	26	6
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	0	1	6	0	0	4	0	0	8	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.6	3.6	0.0	3.6	3.6	0.0	0.0	3.6	0.0	0.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	12	27	0	12	27	0	0	31	0	0	31	0
Vehicle Extension [s]	2.5	2.5	0.0	2.5	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	15	0	0	15	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.6	2.6	0.0	2.6	2.6	0.0	0.0	2.6	0.0	0.0	2.6	0.0
Minimum Recall	no	no		no	no			no			no	
Maximum Recall	no	yes		no	yes			no			no	
Pedestrian Recall	no	no		no	no			no			no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	6	48	48	5	47	47	4	4	4	4
g / C, Green / Cycle	0.08	0.68	0.68	0.07	0.67	0.67	0.05	0.05	0.05	0.05
(v / s)_i Volume / Saturation Flow Rate	0.06	0.05	0.04	0.04	0.09	0.01	0.03	0.01	0.05	0.00
s, saturation flow rate [veh/h]	1597	1676	1623	1597	3192	1425	1241	1500	675	1425
c, Capacity [veh/h]	133	1143	1106	108	2126	949	103	80	100	76
d1, Uniform Delay [s]	31.17	3.71	3.68	31.51	4.28	3.92	34.89	31.72	32.77	31.41
k, delay calibration	0.08	0.50	0.50	0.08	0.50	0.50	0.08	0.08	0.08	0.08
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.08	0.12	0.10	3.21	0.13	0.02	1.75	1.29	1.49	0.33
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

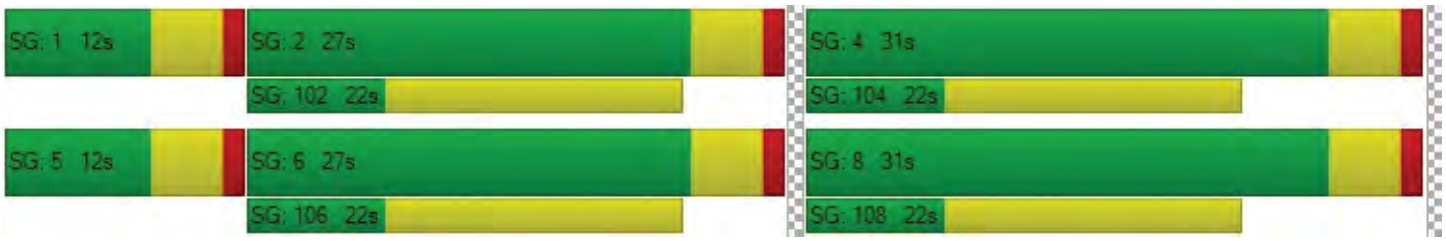
X, volume / capacity	0.71	0.07	0.06	0.55	0.14	0.01	0.39	0.26	0.34	0.08
d, Delay for Lane Group [s/veh]	36.25	3.83	3.78	34.73	4.42	3.94	36.64	33.01	34.26	31.74
Lane Group LOS	D	A	A	C	A	A	D	C	C	C
Critical Lane Group	yes	no	no	no	yes	no	no	no	yes	no
50th-Percentile Queue Length [veh]	1.65	0.30	0.24	1.01	0.58	0.04	0.74	0.36	0.61	0.10
50th-Percentile Queue Length [ft]	41.34	7.46	5.93	25.36	14.53	0.89	18.56	9.08	15.20	2.54
95th-Percentile Queue Length [veh]	2.98	0.54	0.43	1.83	1.05	0.06	1.34	0.65	1.09	0.18
95th-Percentile Queue Length [ft]	74.42	13.43	10.68	45.64	26.16	1.59	33.40	16.35	27.35	4.57

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	36.25	3.81	3.78	34.73	4.42	3.94	36.64	33.01	33.01	34.26	34.26	31.74
Movement LOS	D	A	A	C	A	A	D	C	C	C	C	C
d_A, Approach Delay [s/veh]	16.57			9.39			35.39			33.88		
Approach LOS	B			A			D			C		
d_I, Intersection Delay [s/veh]	15.51											
Intersection LOS	B											
Intersection V/C	0.200											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
#92: Pats Ranch Road / Ivory Street

Control Type:	Two-way stop	Delay (sec / veh):	12.0
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.014

Intersection Setup

Name	Pats Ranch Road		Pats Ranch Road		Ivory Street	
Approach	Northbound		Southbound		Westbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	200.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		yes	

Volumes

Name	Pats Ranch Road		Pats Ranch Road		Ivory Street	
Base Volume Input [veh/h]	189	16	27	257	6	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	189	16	27	257	6	16
Peak Hour Factor	0.8290	0.8290	0.8290	0.8290	0.8290	0.8290
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	57	5	8	78	2	5
Total Analysis Volume [veh/h]	228	19	33	310	7	19
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			no
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.03	0.00	0.01	0.02
d_M, Delay for Movement [s/veh]	0.00	0.00	7.81	0.00	12.05	9.07
Movement LOS	A	A	A	A	B	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.08	0.00	0.04	0.06
95th-Percentile Queue Length [ft]	0.00	0.00	1.93	0.00	1.03	1.61
d_A, Approach Delay [s/veh]	0.00		0.75		9.87	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.83					
Intersection LOS	B					

Intersection Level Of Service Report
#93: Pats Ranch Road / 68th Street

Control Type:	All-way stop	Delay (sec / veh):	13.5
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	Pats Ranch Road		68th Street		68th Street	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1
Pocket Length [ft]	100.00	100.00	200.00	100.00	100.00	220.00
Speed [mph]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	yes		no		no	

Volumes

Name	Pats Ranch Road		68th Street		68th Street	
Base Volume Input [veh/h]	30	233	189	232	209	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	233	189	232	209	16
Peak Hour Factor	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	69	56	68	62	5
Total Analysis Volume [veh/h]	35	275	223	274	246	19
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

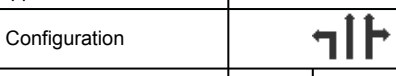
Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.23	2.43	2.09	2.61	0.90	0.90	0.10
95th-Percentile Queue Length [ft]	5.65	60.67	52.24	65.15	22.42	22.42	2.50
Approach Delay [s/veh]	13.45		14.64		11.41		
Approach LOS	B		B		B		
Intersection Delay [s/veh]	13.50						
Intersection LOS	B						

Intersection Level Of Service Report
#94: Wineville Avenue / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	27.3
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.540

Intersection Setup

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Pocket Length [ft]	185.00	100.00	100.00	100.00	100.00	100.00	250.00	100.00	360.00	245.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Base Volume Input [veh/h]	51	46	33	127	90	194	169	956	65	52	853	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	32	0	0	0
Total Hourly Volume [veh/h]	51	46	33	127	90	194	169	956	33	52	853	74
Peak Hour Factor	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	12	9	34	24	53	46	259	9	14	231	20
Total Analysis Volume [veh/h]	55	50	36	138	98	210	183	1036	36	56	924	80
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	26.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	5	0	4	5	0	4	6	0	4	6	0
Maximum Green [s]	37	58	0	37	58	0	20	0	0	75	0	0
Amber [s]	3.0	4.3	0.0	3.0	4.3	0.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0
Split [s]	25	36	0	16	27	0	20	39	0	9	28	0
Vehicle Extension [s]	1.5	2.0	0.0	1.5	2.0	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Walk [s]	0	5	0	0	5	0	0	10	0	0	10	0
Pedestrian Clearance [s]	0	21	0	0	16	0	0	13	0	0	12	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	1.5	3.3	0.0	1.5	3.3	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	no		no	no		no	yes		no	yes	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	L	C	R	L	C	C
L, Total Lost Time per Cycle [s]	3.50	5.30	5.30	3.50	5.30	3.50	6.00	6.00	3.50	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.50	3.30	3.30	1.50	3.30	1.50	4.00	4.00	1.50	4.00	4.00
g_i, Effective Green Time [s]	4	15	15	9	20	12	53	53	4	45	45
g / C, Green / Cycle	0.04	0.15	0.15	0.09	0.20	0.12	0.53	0.53	0.04	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.03	0.03	0.02	0.08	0.19	0.10	0.29	0.02	0.03	0.20	0.20
s, saturation flow rate [veh/h]	1774	1863	1597	1774	1663	1774	3547	1583	1774	1863	1790
c, Capacity [veh/h]	72	279	240	169	340	215	1883	840	73	840	807
d1, Uniform Delay [s]	47.56	37.11	37.04	44.44	38.85	43.09	15.56	11.27	47.50	18.75	18.76
k, delay calibration	0.04	0.04	0.04	0.09	0.04	0.11	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.30	0.11	0.11	8.04	3.71	9.04	1.16	0.10	6.06	1.63	1.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.77	0.17	0.16	0.82	0.90	0.85	0.55	0.04	0.77	0.43	0.43
d, Delay for Lane Group [s/veh]	53.86	37.21	37.15	52.48	42.56	52.13	16.72	11.37	53.56	20.38	20.45
Lane Group LOS	D	D	D	D	D	D	B	B	D	C	C
Critical Lane Group	yes	no	no	no	yes	no	yes	no	yes	no	no
50th-Percentile Queue Length [veh]	1.44	0.99	0.79	3.61	7.36	4.80	7.22	0.37	1.43	5.45	5.26
50th-Percentile Queue Length [ft]	35.92	24.86	19.77	90.19	184.03	119.93	180.46	9.26	35.80	136.29	131.42
95th-Percentile Queue Length [veh]	2.59	1.79	1.42	6.49	11.81	8.39	11.62	0.67	2.58	9.28	9.02
95th-Percentile Queue Length [ft]	64.66	44.76	35.58	162.34	295.27	209.73	290.62	16.67	64.44	232.02	225.42

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	53.86	37.21	37.15	52.48	42.56	42.56	52.13	16.72	11.37	53.56	20.41	20.45
Movement LOS	D	D	D	D	D	D	D	B	B	D	C	C
d_A, Approach Delay [s/veh]	43.69			45.63			21.73			22.83		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	27.32											
Intersection LOS	C											
Intersection V/C	0.540											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX 3.3:

EXISTING (2014) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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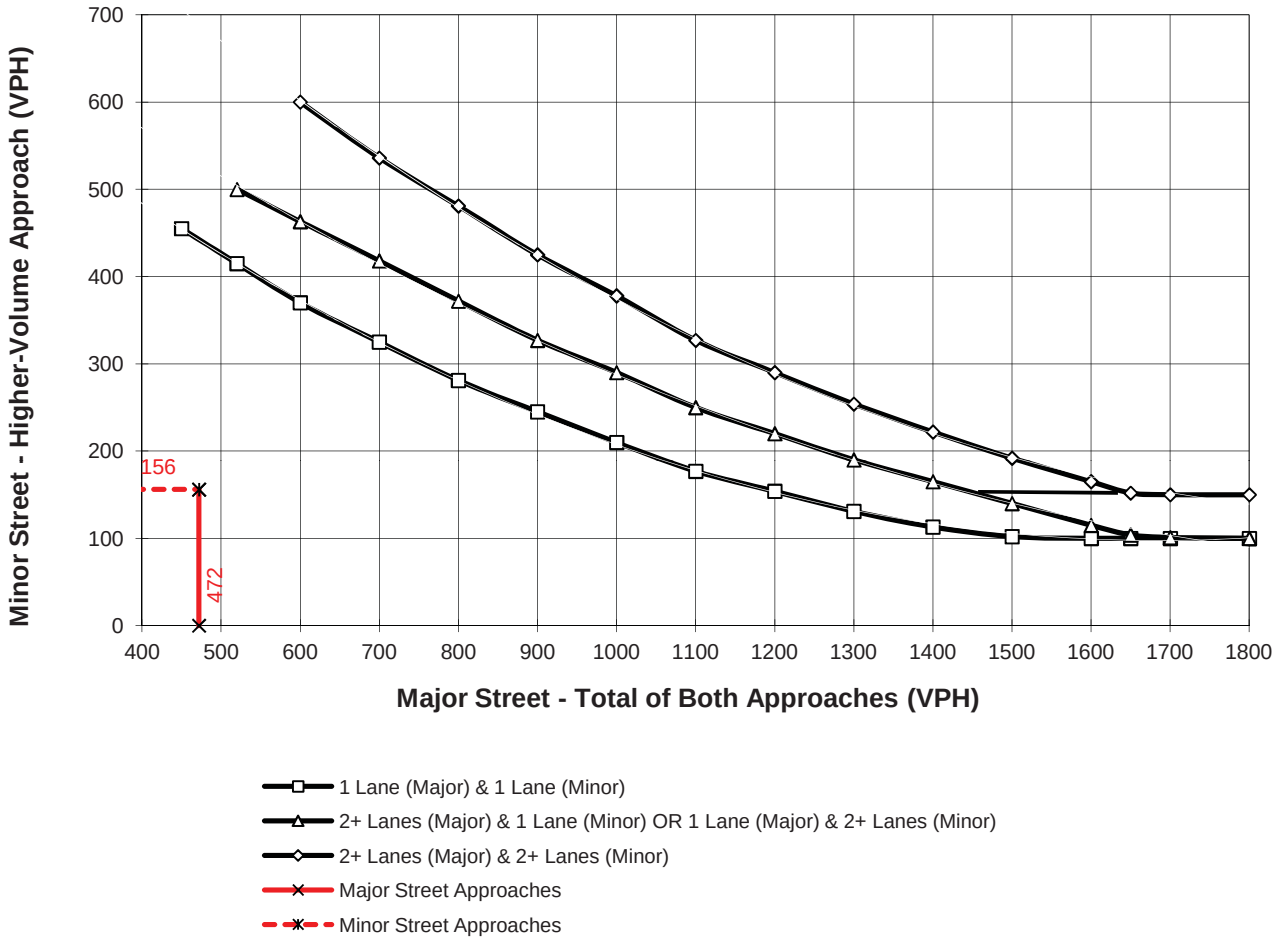
Figure 4C-3. Warrant 3, Peak Hour

Traffic Conditions = **Existing (2014) Conditions - Weekday Mid-day Peak Hour**

Major Street Name = **Pats Ranch Road**
Total of Both Approaches (VPH) = **472**
Number of Approach Lanes on Major Street = **2**

Minor Street Name = **Ivory Street**
High Volume Approach (VPH) = **156**
Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 150 vph applies as the lower threshold for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

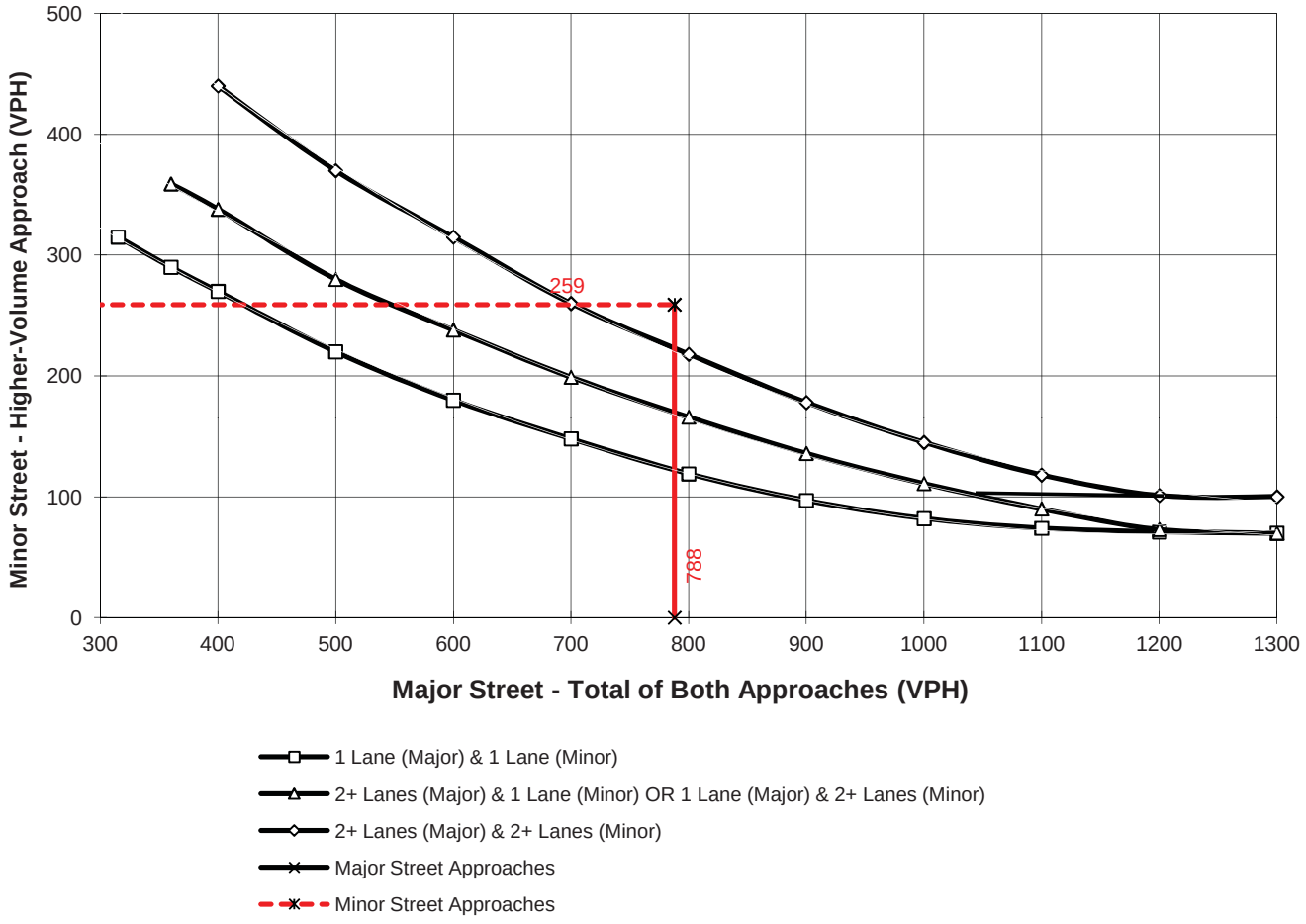
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Existing (2014) Conditions - Weekday Mid-day Peak Hour**

Major Street Name = **68th Street** Total of Both Approaches (VPH) = **788**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Pats Ranch Road** High Volume Approach (VPH) = **259**
Number of Approach Lanes Minor Street = **2**

WARRANTED FOR A SIGNAL



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

APPENDIX 3.4:

EXISTING (2014) CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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Intersection: 33: I-15 SB Ramps & Limonite Av.

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	540	441	250	277	301	92	74	153	257	212
Average Queue (ft)	317	186	109	173	178	7	5	66	147	89
95th Queue (ft)	500	377	206	255	269	43	35	130	235	199
Link Distance (ft)	1184	1184				705	705		1101	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)			150	275	275			400		400
Storage Blk Time (%)		3	4	0	1					
Queuing Penalty (veh)		11	18	1	3					

Intersection: 34: I-15 NB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	302	333	236	180	558	493	198	176	241	208
Average Queue (ft)	148	161	49	69	361	277	86	90	135	80
95th Queue (ft)	260	278	150	149	514	444	159	157	221	189
Link Distance (ft)			705	705	1130	1130			1258	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300	300					150	450		450
Storage Blk Time (%)	0	0				11	1			
Queuing Penalty (veh)	0	1				35	7			

Network Summary

Network wide Queuing Penalty: 76

Intersection: 33: I-15 SB Ramps & Limonite Av.

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	431	360	243	212	228	155	140	211	283	256
Average Queue (ft)	251	184	102	111	119	52	41	107	197	146
95th Queue (ft)	367	311	196	181	193	122	109	196	265	249
Link Distance (ft)	1184	1184				705	705		1101	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)			150	275	275			400		400
Storage Blk Time (%)		7	2		0					
Queuing Penalty (veh)		30	10		0					

Intersection: 34: I-15 NB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	221	225	252	262	371	318	127	293	340	319
Average Queue (ft)	103	118	118	142	228	157	47	169	239	195
95th Queue (ft)	180	193	213	238	327	270	96	251	319	284
Link Distance (ft)			705	705	1130	1130			1258	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300	300					150	450		450
Storage Blk Time (%)	0		0			4	0			
Queuing Penalty (veh)	0		0			10	0			

Network Summary

Network wide Queuing Penalty: 51

APPENDIX 3.5:

EXISTING (2014) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Option 1: AM Improvements

Number	93					
Intersection	Pats Ranch Road / 68th Street					
Control Type	Signalized					
Analysis Method	HCM 2010					
Name	Pats Ranch Road		68th Street		68th Street	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Base Volume Input [veh/h]	25	193	250	407	379	35
Total Analysis Volume [veh/h]	34	261	338	551	513	47

Intersection Settings

Cycle Length [s]	95					
Coordination Type	Time of Day Pattern Coordinated					
Actuation Type	Fixed time					
Lost time [s]	0.00					
Control Type	Permissive	Overlap	Protected	Permissive	Permissive	Permissive
Signal Group	5	3	3	8	4	0
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	10	10	10	10	10	0
Maximum Green [s]	0	0	0	0	0	0
Amber [s]	5.0	3.0	3.0	5.0	5.0	0.0
All red [s]	2.0	1.0	1.0	2.0	2.0	0.0
Split [s]	27	34	34	68	34	0
Walk [s]	7	0	0	7	7	0
Pedestrian Clearance [s]	20	0	0	20	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	no	no	no	no	no	
Maximum Recall	no	no	no	yes	yes	
Pedestrian Recall	no	no	no	no	no	

Lane Group Calculations

g / C, Green / Cycle	0.21	0.60	0.32	0.64	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.02	0.18	0.21	0.33	0.16	0.03
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900
Arrival type	3		3		3	
s, saturation flow rate [veh/h]	1597	1425	1597	1676	3192	1425
c, Capacity [veh/h]	336	855	504	1076	907	405
X, volume / capacity	0.10	0.31	0.67	0.51	0.57	0.12
d, Delay for Lane Group [s/veh]	30.85	10.23	35.14	10.80	31.55	25.75
Lane Group LOS	C	B	D	B	C	C
Critical Lane Group	no	yes	yes	no	yes	no
50th-Percentile Queue Length [veh]	0.67	2.60	7.18	5.35	5.00	0.81
50th-Percentile Queue Length [ft]	16.80	64.95	179.61	133.64	125.11	20.26
95th-Percentile Queue Length [veh]	1.21	4.68	11.58	9.14	8.67	1.46
95th-Percentile Queue Length [ft]	30.23	116.90	289.51	228.44	216.83	36.46

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	30.85	10.23	35.14	10.80	31.55	25.75
Movement LOS	C	B	D	B	C	C
Critical Movement	no	no	yes	no	no	no
d_A, Approach Delay [s/veh]	12.60		20.06		31.06	
Approach LOS	B		C		C	
d_I, Intersection Delay [s/veh]	22.33					
Intersection LOS	C					
Intersection V/C	0.556					

Option 1: Mid-Day Improvements

Number	93					
Intersection	Pats Ranch Road / 68th Street					
Control Type	Signalized					
Analysis Method	HCM 2010					
Name	Pats Ranch Road		68th Street		68th Street	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Base Volume Input [veh/h]	28	231	187	253	307	41
Total Analysis Volume [veh/h]	41	341	276	373	453	60

Intersection Settings

Cycle Length [s]	60					
Coordination Type	Time of Day Pattern Coordinated					
Actuation Type	Fixed time					
Lost time [s]	0.00					
Control Type	Permissive	Overlap	Protected	Permissive	Permissive	Permissive
Signal Group	5	3	3	8	4	0
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	10	10	10	10	10	0
Maximum Green [s]	0	0	0	0	0	0
Amber [s]	5.0	3.0	3.0	5.0	5.0	0.0
All red [s]	2.0	1.0	1.0	2.0	2.0	0.0
Split [s]	17	21	21	43	22	0
Walk [s]	5	0	0	5	5	0
Pedestrian Clearance [s]	10	0	0	10	10	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	no	no	no	no	no	
Maximum Recall	no	no	no	yes	yes	
Pedestrian Recall	no	no	no	no	no	

Lane Group Calculations

g / C, Green / Cycle	0.17	0.57	0.28	0.60	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.03	0.24	0.17	0.22	0.14	0.04
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900
Arrival type	3		3		3	
s, saturation flow rate [veh/h]	1597	1425	1597	1676	3192	1425
c, Capacity [veh/h]	266	808	452	1006	798	356
X, volume / capacity	0.15	0.42	0.61	0.37	0.57	0.17
d, Delay for Lane Group [s/veh]	22.61	9.02	24.65	7.22	22.58	18.64
Lane Group LOS	C	A	C	A	C	B
Critical Lane Group	no	yes	no	no	yes	no
50th-Percentile Queue Length [veh]	0.54	2.21	3.55	1.78	2.68	0.66
50th-Percentile Queue Length [ft]	13.61	55.16	88.81	44.54	67.05	16.52
95th-Percentile Queue Length [veh]	0.98	3.97	6.39	3.21	4.83	1.19
95th-Percentile Queue Length [ft]	24.49	99.28	159.86	80.17	120.68	29.73

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	22.61	9.02	24.65	7.22	22.58	18.64
Movement LOS	C	A	C	A	C	B
Critical Movement	no	no	yes	no	no	no
d_A, Approach Delay [s/veh]	10.48		14.63		22.12	
Approach LOS	B		B		C	
d_I, Intersection Delay [s/veh]	16.10					
Intersection LOS	B					
Intersection V/C	0.381					

Option 1: PM Improvements

Number	93					
Intersection	Pats Ranch Road / 68th Street					
Control Type	Signalized					
Analysis Method	HCM 2010					
Name	Pats Ranch Road		68th Street		68th Street	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Base Volume Input [veh/h]	30	233	189	232	209	16
Total Analysis Volume [veh/h]	35	275	223	274	246	19

Intersection Settings

Cycle Length [s]	90					
Coordination Type	Time of Day Pattern Coordinated					
Actuation Type	Fixed time					
Lost time [s]	0.00					
Control Type	Permissive	Overlap	Protected	Permissive	Permissive	Permissive
Signal Group	5	3	3	8	4	0
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	10	10	10	10	10	0
Maximum Green [s]	0	0	0	0	0	0
Amber [s]	5.0	3.0	3.0	5.0	5.0	0.0
All red [s]	2.0	1.0	1.0	2.0	2.0	0.0
Split [s]	27	29	29	63	34	0
Walk [s]	7	0	0	7	7	0
Pedestrian Clearance [s]	20	0	0	20	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	no	no	no	no	no	
Maximum Recall	no	no	no	yes	yes	
Pedestrian Recall	no	no	no	no	no	

Lane Group Calculations

g / C, Green / Cycle	0.22	0.58	0.28	0.62	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.02	0.19	0.14	0.16	0.08	0.01
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900
Arrival type	3		3		3	
s, saturation flow rate [veh/h]	1597	1425	1597	1676	3192	1425
c, Capacity [veh/h]	355	823	444	1043	958	428
X, volume / capacity	0.10	0.33	0.50	0.26	0.26	0.04
d, Delay for Lane Group [s/veh]	28.39	11.03	31.31	8.29	24.54	22.54
Lane Group LOS	C	B	C	A	C	C
Critical Lane Group	no	yes	no	no	yes	no
50th-Percentile Queue Length [veh]	0.64	2.79	4.25	2.10	1.94	0.29
50th-Percentile Queue Length [ft]	15.98	69.67	106.32	52.59	48.58	7.29
95th-Percentile Queue Length [veh]	1.15	5.02	7.63	3.79	3.50	0.52
95th-Percentile Queue Length [ft]	28.76	125.40	190.87	94.66	87.45	13.12

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	28.39	11.03	31.31	8.29	24.54	22.54
Movement LOS	C	B	C	A	C	C
Critical Movement	no	no	yes	no	no	no
d_A, Approach Delay [s/veh]	12.99		18.62		24.40	
Approach LOS	B		B		C	
d_I, Intersection Delay [s/veh]	18.42					
Intersection LOS	B					
Intersection V/C	0.270					

APPENDIX 4.1:

POST PROCESSING WORKSHEETS

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Project:	==========>	Vernola Marketplace Apartments TIA	<===	Job #:	09210
Scenario:	==========>	2035 With Project	<===	Analyst:	CHS
Existing Conditions Model Run ID:	==>	2008 RivTAM	<===	Date:	5/28/14
Future Conditions Model Run ID:	==>	2035 RivTAM	<===		

LOCATION: **Hamner Avenue / 68th Street**

AM PEAK HOUR	PM PEAK HOUR
EXISTING TURNING MOVEMENT VOLUMES: **2014** **38 497 51** < v > **108** ^ ^ **78** **175** > < **170** **76** v v **223** < ^ > 2258 **45 646 151**	EXISTING TURNING MOVEMENT VOLUMES: 2014 **60 561 96** < v > **56** ^ ^ **76** **106** > < **129** **34** v v **161** < ^ > 2172 **69 636 188**
EXISTING MODEL YEAR: **2008** **263 367** v ^ **0** < IN = 864 < **168** **0** > OUT = 865 > **180** v ^ **318 433**	EXISTING MODEL YEAR: 2008 **442 347** v ^ **0** < IN = 1159 < **247** **0** > OUT = 1159 > **277** v ^ **535 470**
FUTURE MODEL YEAR: **2035** **545 458** v ^ **0** < IN = 1354 < **297** **0** > OUT = 1353 > **260** v ^ **635 512**	FUTURE MODEL YEAR: 2035 **855 1417** v ^ **0** < IN = 2933 < **602** **0** > OUT = 2933 > **453** v ^ **1063 1476**
EXISTING (COUNTED) ADTs BY LEG: 2014 **18,861** N **6,483** W **LEG** E **10,796** S **23,548**	EXISTING (COUNTED) ADTs BY LEG: 2014 18,861 N 6,483 W + E 10,796 S 23,548
REFINED FUTURE ADT'S BY LEG: 2035 **13,797** N **0** W **LEG** E **7,882** S **15,280**	REFINED FUTURE ADT'S BY LEG: 2035 13,797 N 0 W + E 7,882 S 15,280

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Project: Vernola Marketplace Apartments TIA
Scenario: 2035 With Project

Job #: 09210
Analyst: CHS
Date: 5/28/14

LOCATION: Hamner Avenue / 68th Street

EXISTING COUNTED INBOUND AND OUTBOUND VOLUME CALCULATION

AM		PM	
EXISTING COUNT YEAR:		EXISTING COUNT YEAR:	
2014	586 832	2014	717 768
	v ^		v ^
253 < IN =	2258 < 471	258 < IN =	2172 < 366
359 > OUT =	2258 > 377	196 > OUT =	2172 > 390
	v ^		v ^
	796 842		756 893
GROWTH CALCULATION DECISION RULE			
MIN = Minimum Count Growth Approach		MIN = Minimum Count Growth Approach	
ADD = Additive (Growth Increment) Approach	ADD ADD	ADD = Additive (Growth Increment) Approach	ADD ADD
MUL = Multiplicative (Ratio) Approach	v ^	MUL = Multiplicative (Ratio) Approach	v ^
ADD <	< ADD	ADD <	< ADD
ADD >	> ADD	ADD >	> ADD
	v ^		v ^
	ADD ADD		ADD ADD
MINIMUM GROWTH %s 2008 TO 2035			
	-27% -27%		-27% -27%
	v ^		v ^
##### <	< -27%	##### <	< -27%
##### >	> -27%	##### >	> -27%
	v ^		v ^
	-35% -35%		-35% -35%
REFINED GROWTH: 2008 TO 2035		ADJUSTED GROWTH: 2008 TO 2035	
	280 90		410 1070
	v ^		v ^
0 <	< 130	0 <	< 360
0 >	> 80	0 >	> 180
	v ^		v ^
	320 80		530 1010
PRORATED GROWTH: 2014 TO 2035		PRORATED GROWTH: 2014 TO 2035	
21 YEARS	220 70	21 YEARS	320 830
	v ^		v ^
0 <	< 100	0 <	< 280
0 >	> 60	0 >	> 140
	v ^		v ^
	250 60		410 790
NEW PROJECTED VOLUMES: 2035		NEW PROJECTED VOLUMES: 2035	
	810 900		1040 1604
	v ^		v ^
250 < IN =	2640 < 570	261 < IN =	3570 < 650
360 > OUT =	2640 > 440	200 > OUT =	3570 > 531
	v ^ *		v ^ *
	1050 900		1173 1680

* NOTE: Outbound future volume may be factored (increased) to match inbound if inbound is greater than outbound.

U:\UcJobs_09100-09500_09200\09210\Post Processing\[1 Hamner_68th.xls] Growth Summary (2)

Project: Vernola Marketplace Apartments TIA
Scenario: 2035 With Project

Job #: 09210
Analyst: CHS
Date: 5/28/14

LOCATION: Hamner Avenue / 68th Street
FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	45	36	-9	-20%	69	62	-7	-10%
	Through	646	690	44	7%	636	1,335	699	110%
	Right	151	175	24	16%	188	289	101	54%
	NB Total	842	901	59	7%	893	1,686	793	89%
SOUTH BOUND	Left	51	80	29	57%	96	145	49	51%
	Through	497	688	191	38%	561	837	276	49%
	Right	38	41	3	8%	60	53	-7	-12%
	SB Total	586	809	223	38%	717	1,035	318	44%
EAST BOUND	Left	108	105	-3	-3%	56	71	15	27%
	Through	175	185	10	6%	106	98	-8	-8%
	Right	76	71	-5	-7%	34	31	-3	-9%
	EB Total	359	361	2	1%	196	200	4	2%
WEST BOUND	Left	223	291	68	30%	161	305	144	89%
	Through	170	173	3	2%	129	145	16	12%
	Right	78	106	28	36%	76	199	123	162%
	WB Total	471	570	99	21%	366	649	283	77%
TOTAL ENTERING VOLUME		2,258	2,641	383	17%	2,172	3,570	1398	64%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	809	1,035			
North Leg	Outbound	901	1,605			
North Leg	**TOTAL**	**1,710**	**2,640**	**12%**	**19%**	**13,797**
South Leg	Inbound	901	1,686			
South Leg	Outbound	1,050	1,173			
South Leg	**TOTAL**	**1,951**	**2,859**	**13%**	**19%**	**15,280**
East Leg	Inbound	570	649			
East Leg	Outbound	440	532			
East Leg	**TOTAL**	**1,010**	**1,181**	**13%**	**15%**	**7,882**
West Leg	Inbound	361	200			
West Leg	Outbound	250	260			
West Leg	**TOTAL**	**611**	**460**	**#DIV/0!**	**#DIV/0!**	**-**
OVERALL TOTAL		***5,282***	***7,140***	**14%**	***19%***	***36,959***

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INPUT DATA

Project:	==========>	Vernola Marketplace Apartments TIA	<===	Job #:	09210
Scenario:	==========>	2035 With Project	<===	Analyst:	CHS
Existing Conditions Model Run ID:	==>	2008 RivTAM	<===	Date:	5/28/14
Future Conditions Model Run ID:	==>	2035 RivTAM	<===		

LOCATION: **I-15 Southbound Ramps / Limonite Avenue**

AM PEAK HOUR

EXISTING TURNING MOVEMENT VOLUMES:

2012			**407**	**2**	**128**			
			<	v	>			
	0	^				^	**0**	
	856	>				<	**530**	
	358	v				v	**551**	
			<	^	>			
2832			**0**	**0**	**0**			

EXISTING MODEL YEAR:

2008				**280**	**0**			
				v	^			
	718	<	IN =	2379	<	**1143**		
	956	>	OUT =	2380	>	**530**		
				v	^			
				1132	**0**			

FUTURE MODEL YEAR:

2035				**655**	**0**			
				v	^			
	1708	<	IN =	5932	<	**2535**		
	2742	>	OUT =	5932	>	**2380**		
				v	^			
				1844	**0**			

EXISTING (COUNTED) ADTs BY LEG:

2012			**11,500**		
			N		
	43,626	W	**LEG**	E	**33,200**
			S		
			10,400		

REFINED FUTURE ADT'S BY LEG:

2035			**10,600**		
			N		
	62,100	W	**LEG**	E	
			S		
			21,400		

PM PEAK HOUR

EXISTING TURNING MOVEMENT VOLUMES:

2012			**676**	**0**	**248**			
			<	v	>			
	0	^				^	**0**	
	1061	>				<	**923**	
	400	v				v	**437**	
			<	^	>			
3745			**0**	**0**	**0**			

EXISTING MODEL YEAR:

2008				**398**	**0**			
				v	^			
	923	<	IN =	2622	<	**1145**		
	1079	>	OUT =	2622	>	**443**		
				v	^			
				1256	**0**			

FUTURE MODEL YEAR:

2035				**1001**	**0**			
				v	^			
	2709	<	IN =	6448	<	**3116**		
	2331	>	OUT =	6448	>	**2139**		
				v	^			
				1600	**0**			

EXISTING (COUNTED) ADTs BY LEG:

2012			11,500		
			N		
	43,626	W	+	E	33,200
			S		
			10,400		

REFINED FUTURE ADT'S BY LEG:

2035			10,600		
			N		
	62,100	W	+	E	0
			S		
			21,400		

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Project: Vernola Marketplace Apartments TIA
Scenario: 2035 With Project

Job #: 09210
Analyst: CHS
Date: 5/28/14

LOCATION: I-15 Southbound Ramps / Limonite Avenue

EXISTING COUNTED INBOUND AND OUTBOUND VOLUME CALCULATION

AM

EXISTING COUNT YEAR: 2012

537 0
v ^
937 < IN = 2832 < 1081
1214 > OUT = 2832 > 984
v ^
911 0

GROWTH CALCULATION DECISION RULE
MIN = Minimum Count Growth Approach
ADD = Additive (Growth Increment) Approach
MUL = Multiplicative (Ratio) Approach

ADD MUL
v ^
ADD < < MUL
ADD > > ADD
v ^
MUL MUL

MINIMUM GROWTH %s 2008 TO 2035

-8% -8%
v ^
0% < < #####
0% > > #####
v ^
0% 0%

REFINED GROWTH: 2008 TO 2035

380 0
v ^
990 < < 1319
1790 > > 1850
v ^
569 0

PRORATED GROWTH: 2012 TO 2035
23 YEARS

320 0
v ^
840 < < 1120
1520 > > 1580
v ^
480 0

NEW PROJECTED VOLUMES: 2035

860 0
v ^
1799 < IN = 5790 < 2200
2730 > OUT = 5790 > 2587
v ^ *
1405 0

PM

EXISTING COUNT YEAR: 2012

924 0
v ^
1599 < IN = 3745 < 1360
1461 > OUT = 3745 > 1309
v ^
837 0

MIN = Minimum Count Growth Approach
ADD = Additive (Growth Increment) Approach
MUL = Multiplicative (Ratio) Approach

ADD MUL
v ^
ADD < < ADD
ADD > > ADD
v ^
MUL MUL

-8% -8%
v ^
0% < < #####
0% > > #####
v ^
0% 0%

ADJUSTED GROWTH: 2008 TO 2035

600 0
v ^
1790 < < 1970
1250 > > 1700
v ^
233 0

PRORATED GROWTH: 2012 TO 2035
23 YEARS

510 0
v ^
1520 < < 1680
1060 > > 1450
v ^
200 0

NEW PROJECTED VOLUMES: 2035

1430 0
v ^
3152 < IN = 6990 < 3040
2520 > OUT = 6990 > 2788
v ^ *
1051 0

* NOTE: Outbound future volume may be factored (increased) to match inbound if inbound is greater than outbound.

U:\UcJobs_09100-09500_09200\09210\Post Processing\[2 I-15 SB_Limonite.xls] Growth Summary (2)

Project: Vernola Marketplace Apartments TIA
Scenario: 2035 With Project

Job #: 09210
Analyst: CHS
Date: 5/28/14

LOCATION: I-15 Southbound Ramps / Limonite Avenue
FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	NB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
SOUTH BOUND	Left	128	289	161	126%	248	566	318	128%
	Through	2	2	0	0%	0	0	0	#DIV/0!
	Right	407	567	160	39%	676	863	187	28%
	SB Total	537	858	321	60%	924	1,429	505	55%
EAST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	856	2,298	1,442	168%	1,061	2,222	1,161	109%
	Right	358	445	87	24%	400	317	-83	-21%
	EB Total	1,214	2,743	1,529	126%	1,461	2,539	1,078	74%
WEST BOUND	Left	551	958	407	74%	437	733	296	68%
	Through	530	1,231	701	132%	923	2,289	1,366	148%
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	WB Total	1,081	2,189	1,108	102%	1,360	3,022	1,662	122%
TOTAL ENTERING VOLUME		2,832	5,790	2958	104%	3,745	6,990	3245	87%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	858	1,429			
North Leg	Outbound	0	0			
North Leg	**TOTAL**	**858**	**1,429**	**8%**	**13%**	**10,600**
South Leg	Inbound	0	0			
South Leg	Outbound	1,405	1,050			
South Leg	**TOTAL**	**1,405**	**1,050**	**7%**	**5%**	**21,400**
East Leg	Inbound	2,189	3,022			
East Leg	Outbound	2,587	2,788			
East Leg	**TOTAL**	**4,776**	**5,810**	**#DIV/0!**	**#DIV/0!**	**-**
West Leg	Inbound	2,743	2,539			
West Leg	Outbound	1,798	3,152			
West Leg	**TOTAL**	**4,541**	**5,691**	**7%**	**9%**	**62,100**
OVERALL TOTAL		***11,580***	***13,980***	**12%**	***15%***	***94,100***

U:\UcJobs_09100-09500_09200\09210\Post Processing\[2 I-15 SB_Limonite.xls]Output (3)

INPUT DATA

Project:	==========>	Vernola Marketplace Apartments TIA	<===	Job #:	09210
Scenario:	==========>	2035 With Project	<===	Analyst:	CHS
Existing Conditions Model Run ID:	==>	2008 RivTAM	<===	Date:	5/28/14
Future Conditions Model Run ID:	==>	2035 RivTAM	<===		

LOCATION: **I-15 Northbound Ramps / Limonite Avenue**

AM PEAK HOUR

EXISTING TURNING MOVEMENT VOLUMES:

2012			**0**	**0**	**0**			
			<	v	>			
	629	^				^	**307**	
	355	>				<	**838**	
	0	v				v	**0**	
			<	^	>			
2609			**243**	**2**	**235**			

EXISTING MODEL YEAR:

2008				**0**	**251**			
				v	^			
	1143	<	IN =	2161	<	**869**		
	530	>	OUT =	2161	>	**767**		
				v	^			
				0	**762**			

FUTURE MODEL YEAR:

2035				**0**	**803**			
				v	^			
	2535	<	IN =	5988	<	**2362**		
	2380	>	OUT =	5989	>	**2651**		
				v	^			
				0	**1246**			

EXISTING (COUNTED) ADTs BY LEG:

2012			**8,300**		
			N		
	33,200	W	**LEG**	E	**35,479**
			S		
			12,400		

REFINED FUTURE ADT'S BY LEG:

2035			**8,900**		
			N		
		W	**LEG**	E	**67,900**
			S		
			19,100		

PM PEAK HOUR

EXISTING TURNING MOVEMENT VOLUMES:

2012			**0**	**0**	**0**			
			<	v	>			
	433	^				^	**237**	
	876	>				<	**975**	
	0	v				v	**0**	
			<	^	>			
3520			**385**	**0**	**614**			

EXISTING MODEL YEAR:

2008				**0**	**208**			
				v	^			
	1145	<	IN =	2205	<	**894**		
	443	>	OUT =	2205	>	**852**		
				v	^			
				0	**868**			

FUTURE MODEL YEAR:

2035				**0**	**715**			
				v	^			
	3116	<	IN =	6656	<	**3014**		
	2139	>	OUT =	6656	>	**2825**		
				v	^			
				0	**1503**			

EXISTING (COUNTED) ADTs BY LEG:

2012			8,300		
			N		
	33,200	W	+	E	35,479
			S		
			12,400		

REFINED FUTURE ADT'S BY LEG:

2035			8,900		
			N		
	0	W	+	E	67,900
			S		
			19,100		

U:\UcJobs_09100-09500_09200\09210\Post Processing\[3 I-15 NB_Limonite.xls]Input (1)

Project: Vernola Marketplace Apartments TIA
Scenario: 2035 With Project

Job #: 09210
Analyst: CHS
Date: 5/28/14

LOCATION: I-15 Northbound Ramps / Limonite Avenue

EXISTING COUNTED INBOUND AND OUTBOUND VOLUME CALCULATION

AM

EXISTING COUNT YEAR: 2012

0 938
v ^
1081 < IN = 2609 < 1145
984 > OUT = 2609 > 590
v ^
0 480

GROWTH CALCULATION DECISION RULE
MIN = Minimum Count Growth Approach
ADD = Additive (Growth Increment) Approach
MUL = Multiplicative (Ratio) Approach

MUL ADD
v ^
MUL < < ADD
ADD > > MUL
v ^
MUL MUL

MINIMUM GROWTH %s 2008 TO 2035

0% 0%
v ^
< < 0%
> > 0%
v ^
0% 0%

REFINED GROWTH: 2008 TO 2035

0 550
v ^
1319 < < 1490
1850 > > 1450
v ^
0 300

PRORATED GROWTH: 2012 TO 2035
23 YEARS

0 470
v ^
1120 < < 1270
1580 > > 1240
v ^
0 260

NEW PROJECTED VOLUMES: 2035

0 1483
v ^
2313 < IN = 5720 < 2420
2560 > OUT = 5720 > 1924
v ^ *
0 740

PM

EXISTING COUNT YEAR: 2012

0 670
v ^
1360 < IN = 3520 < 1212
1309 > OUT = 3520 > 1490
v ^
0 999

MIN = Minimum Count Growth Approach
ADD = Additive (Growth Increment) Approach
MUL = Multiplicative (Ratio) Approach

MUL ADD
v ^
ADD < < ADD
ADD > > ADD
v ^
MUL ADD

0% 0%
v ^
< < 0%
> > 0%
v ^
0% 0%

ADJUSTED GROWTH: 2008 TO 2035

0 510
v ^
1970 < < 2120
1700 > > 1970
v ^
0 640

PRORATED GROWTH: 2012 TO 2035
23 YEARS

0 430
v ^
1680 < < 1810
1450 > > 1680
v ^
0 550

NEW PROJECTED VOLUMES: 2035

0 1103
v ^
3048 < IN = 7330 < 3020
2760 > OUT = 7330 > 3179
v ^ *
0 1550

* NOTE: Outbound future volume may be factored (increased) to match inbound if inbound is greater than outbound.

U:\UcJobs_09100-09500_09200\09210\Post Processing\[3 I-15 NB_Limonite.xls] Growth Summary (2)

Project: Vernola Marketplace Apartments TIA
Scenario: 2035 With Project

Job #: 09210
Analyst: CHS
Date: 5/28/14

LOCATION: I-15 Northbound Ramps / Limonite Avenue
FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	243	311	68	28%	385	509	124	32%
	Through	2	1	-1	-50%	0	0	0	#DIV/0!
	Right	235	427	192	82%	614	1,043	429	70%
	NB Total	480	739	259	54%	999	1,552	553	55%
SOUTH BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	SB Total	0	0	0	#DIV/0!	0	0	0	#DIV/0!
EAST BOUND	Left	629	1,063	434	69%	433	630	197	45%
	Through	355	1,497	1,142	322%	876	2,136	1,260	144%
	Right	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	EB Total	984	2,560	1,576	160%	1,309	2,766	1,457	111%
WEST BOUND	Left	0	0	0	#DIV/0!	0	0	0	#DIV/0!
	Through	838	2,002	1,164	139%	975	2,540	1,565	161%
	Right	307	418	111	36%	237	473	236	100%
	WB Total	1,145	2,420	1,275	111%	1,212	3,013	1,801	149%
TOTAL ENTERING VOLUME		2,609	5,719	3110	119%	3,520	7,331	3811	108%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	0	0			
North Leg	Outbound	1,482	1,103			
North Leg	**TOTAL**	**1,482**	**1,103**	**17%**	**12%**	**8,900**
South Leg	Inbound	739	1,552			
South Leg	Outbound	0	0			
South Leg	**TOTAL**	**739**	**1,552**	**4%**	**8%**	**19,100**
East Leg	Inbound	2,420	3,013			
East Leg	Outbound	1,924	3,179			
East Leg	**TOTAL**	**4,344**	**6,192**	**6%**	**9%**	**67,900**
West Leg	Inbound	2,560	2,766			
West Leg	Outbound	2,313	3,049			
West Leg	**TOTAL**	**4,873**	**5,815**	**#DIV/0!**	**#DIV/0!**	**-**
OVERALL TOTAL		***11,438***	***14,662***	**12%**	***15%***	***95,900***

U:\UcJobs_09100-09500_09200\09210\Post Processing\[3 I-15 NB_Limonite.xls]Output (3)

Project:	==========>	Vernola Marketplace Apartments TIA	<===	Job #:	09210
Scenario:	==========>	2035 With Project	<===	Analyst:	CHS
Existing Conditions Model Run ID:	==>	2008 RivTAM	<===	Date:	5/28/14
Future Conditions Model Run ID:	==>	2035 RivTAM	<===		

LOCATION: **Wineville Avenue / Limonite Avenue**

AM PEAK HOUR	**PM PEAK HOUR**
EXISTING TURNING MOVEMENT VOLUMES:	EXISTING TURNING MOVEMENT VOLUMES:
2012 **119 48 26**	2012 **167 77 64**
< v >	< v >
60 ^ ^ **24**	**148** ^ ^ **56**
377 > < **734**	**991** > < **743**
50 v v **26**	**78** v v **31**
< ^ >	< ^ >
1614 **75 44 31**	2505 **81 28 41**
EXISTING MODEL YEAR:	EXISTING MODEL YEAR:
2008 **163 163**	2008 **173 169**
v ^	v ^
819 < IN = 1594 < **652**	**882** < IN = 1702 < **712**
764 > OUT = 1595 > **602**	**802** > OUT = 1703 > **635**
v ^	v ^
11 15	**17 15**
FUTURE MODEL YEAR:	FUTURE MODEL YEAR:
2035 **591 572**	2035 **793 681**
v ^	v ^
2283 < IN = 5107 < **1777**	**3024** < IN = 6041 < **2401**
2669 > OUT = 5106 > **2203**	**2772** > OUT = 6040 > **2241**
v ^	v ^
48 70	**94 75**
EXISTING (COUNTED) ADTs BY LEG:	EXISTING (COUNTED) ADTs BY LEG:
2012 **6,700**	2012 6,700
N	N
27,500 W **LEG** E **24,000**	27,500 W + E 24,000
S	S
4,200	4,200
REFINED FUTURE ADT'S BY LEG:	REFINED FUTURE ADT'S BY LEG:
2035 **15,300**	2035 15,300
N	N
67,000 W **LEG** E **54,600**	67,000 W + E 54,600
S	S
2,000	2,000

U:\UcJobs_09100-09500_09200\09210\Post Processing\[9 Wineville_Limonite.xls]Input (1)

Project: Vernola Marketplace Apartments TIA
Scenario: 2035 With Project

Job #: 09210
Analyst: CHS
Date: 5/28/14

LOCATION: Wineville Avenue / Limonite Avenue

EXISTING COUNTED INBOUND AND OUTBOUND VOLUME CALCULATION

AM

EXISTING COUNT YEAR: 2012

		193	128		
		v	^		
928 <	IN =	1614	<	784	
487 >	OUT =	1614	>	434	
		v	^		
		124	150		

GROWTH CALCULATION DECISION RULE
MIN = Minimum Count Growth Approach
ADD = Additive (Growth Increment) Approach
MUL = Multiplicative (Ratio) Approach

		ADD	MUL		
		v	^		
ADD <				< ADD	
MUL >				> MUL	
		v	^		
		ADD	ADD		

MINIMUM GROWTH %s 2008 TO 2035

		0%	0%		
		v	^		
0% <				< 0%	
0% >				> 0%	
		v	^		
		-52%	-52%		

REFINED GROWTH: 2008 TO 2035

		430	322		
		v	^		
1460 <				< 1130	
1213 >				> 1156	
		v	^		
		40	60		

PRORATED GROWTH: 2012 TO 2035
23 YEARS

		370	270		
		v	^		
1240 <				< 960	
1030 >				> 980	
		v	^		
		30	50		

NEW PROJECTED VOLUMES: 2035

		560	400		
		v	^		
2170 <	IN =	4020	<	1740	
1520 >	OUT =	4130	>	1410	
		v	^	*	
		150	200		

PM

EXISTING COUNT YEAR: 2012

		308	232		
		v	^		
991 <	IN =	2505	<	830	
1217 >	OUT =	2505	>	1096	
		v	^		
		186	150		

MIN = Minimum Count Growth Approach
ADD = Additive (Growth Increment) Approach
MUL = Multiplicative (Ratio) Approach

		ADD	ADD		
		v	^		
ADD <				< ADD	
ADD >				> ADD	
		v	^		
		ADD	ADD		

		0%	0%		
		v	^		
0% <				< 0%	
0% >				> 0%	
		v	^		
		-52%	-52%		

ADJUSTED GROWTH: 2008 TO 2035

		620	510		
		v	^		
2140 <				< 1690	
1970 >				> 1610	
		v	^		
		80	60		

PRORATED GROWTH: 2012 TO 2035
23 YEARS

		530	430		
		v	^		
1820 <				< 1440	
1680 >				> 1370	
		v	^		
		70	50		

NEW PROJECTED VOLUMES: 2035

		840	661		
		v	^		
2815 <	IN =	6210	<	2270	
2900 >	OUT =	6210	>	2474	
		v	^	*	
		260	200		

* NOTE: Outbound future volume may be factored (increased) to match inbound if inbound is greater than outbound.

U:\UcJobs_09100-09500_09200\09210\Post Processing\[9 Wineville_Limonite.xls] Growth Summary (2)

Project: Vernola Marketplace Apartments TIA
Scenario: 2035 With Project

Job #: 09210
Analyst: CHS
Date: 5/28/14

LOCATION: Wineville Avenue / Limonite Avenue
FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	75	88	13	17%	81	121	40	49%
	Through	44	74	30	68%	28	39	11	39%
	Right	31	43	12	39%	41	41	0	0%
	NB Total	150	205	55	37%	150	201	51	34%
SOUTH BOUND	Left	26	103	77	296%	64	149	85	133%
	Through	48	67	19	40%	77	112	35	45%
	Right	119	404	285	239%	167	584	417	250%
	SB Total	193	574	381	197%	308	845	537	174%
EAST BOUND	Left	60	247	187	312%	148	475	327	221%
	Through	377	1,264	887	235%	991	2,284	1,293	130%
	Right	50	59	9	18%	78	112	34	44%
	EB Total	487	1,570	1,083	222%	1,217	2,871	1,654	136%
WEST BOUND	Left	26	24	-2	-8%	31	36	5	16%
	Through	734	1,678	944	129%	743	2,109	1,366	184%
	Right	24	79	55	229%	56	147	91	163%
	WB Total	784	1,781	997	127%	830	2,292	1,462	176%
TOTAL ENTERING VOLUME		1,614	4,130	2516	156%	2,505	6,209	3704	148%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	574	845			
North Leg	Outbound	400	661			
North Leg	**TOTAL**	**974**	**1,506**	**6%**	**10%**	**15,300**
South Leg	Inbound	205	201			
South Leg	Outbound	150	260			
South Leg	**TOTAL**	**355**	**461**	**18%**	**23%**	**2,000**
East Leg	Inbound	1,781	2,292			
East Leg	Outbound	1,410	2,474			
East Leg	**TOTAL**	**3,191**	**4,766**	**6%**	**9%**	**54,600**
West Leg	Inbound	1,570	2,871			
West Leg	Outbound	2,170	2,814			
West Leg	**TOTAL**	**3,740**	**5,685**	**6%**	**8%**	**67,000**
OVERALL TOTAL		***8,260***	***12,418***	**6%**	***9%***	***138,900***

U:\UcJobs_09100-09500_09200\09210\Post Processing\[9 Wineville_Limonite.xls]Output (3)

Project:	==========>	Vernola Marketplace Apartments TIA	<===	Job #:	09210
Scenario:	==========>	2035 With Project	<===	Analyst:	CHS
Existing Conditions Model Run ID:	==>	2008 RivTAM	<===	Date:	5/28/14
Future Conditions Model Run ID:	==>	2035 RivTAM	<===		

LOCATION: **Etiwanda Avenue / Limonite Avenue**

AM PEAK HOUR	**PM PEAK HOUR**
EXISTING TURNING MOVEMENT VOLUMES:	EXISTING TURNING MOVEMENT VOLUMES:
2012 **105 67 81** < v >	2012 **137 129 96** < v >
83 ^ ^ **82** **409** > < **572** **14** v v **42**	**135** ^ ^ **95** **725** > < **459** **19** v v **56**
< ^ >	< ^ >
1669 **27 89 98**	2146 **49 110 136**
EXISTING MODEL YEAR:	EXISTING MODEL YEAR:
2008 **121 246** v ^	2008 **363 176** v ^
685 < IN = 1865 < **664** **668** > OUT = 1864 > **699**	**788** < IN = 2261 < **807** **678** > OUT = 2262 > **787**
v ^ **234 412**	v ^ **511 413**
FUTURE MODEL YEAR:	FUTURE MODEL YEAR:
2035 **420 652** v ^	2035 **985 615** v ^
1835 < IN = 4937 < **1535** **2320** > OUT = 4937 > **2034**	**2529** < IN = 6069 < **2146** **2319** > OUT = 6068 > **1969**
v ^ **416 662**	v ^ **955 619**
EXISTING (COUNTED) ADTs BY LEG:	EXISTING (COUNTED) ADTs BY LEG:
2012 **8,700** N	2012 8,700 N
19,000 W **LEG** E **19,500** S	19,000 W + E 19,500 S
6,200	6,200
REFINED FUTURE ADT'S BY LEG:	REFINED FUTURE ADT'S BY LEG:
2035 **13,200** N	2035 13,200 N
56,900 W **LEG** E **49,500** S	56,900 W + E 49,500 S
14,700	14,700

U:\UcJobs_09100-09500_09200\09210\Post Processing\[10 Etiwanda_Limonite.xls]Input (1)

Project: Vernola Marketplace Apartments TIA
Scenario: 2035 With Project

Job #: 09210
Analyst: CHS
Date: 5/28/14

LOCATION: Etiwanda Avenue / Limonite Avenue

EXISTING COUNTED INBOUND AND OUTBOUND VOLUME CALCULATION

AM

EXISTING COUNT YEAR: 2012

			253	254		
			v	^		
	704	<	IN =	1669	<	696
	506	>	OUT =	1669	>	588
			v	^		
			123	214		

GROWTH CALCULATION DECISION RULE
MIN = Minimum Count Growth Approach
ADD = Additive (Growth Increment) Approach
MUL = Multiplicative (Ratio) Approach

			ADD	ADD		
			v	^		
	ADD	<			<	ADD
	MUL	>			>	MUL
			v	^		
			MUL	MUL		

MINIMUM GROWTH %s 2008 TO 2035

			0%	0%		
			v	^		
	0%	<			<	0%
	0%	>			>	0%
			v	^		
			0%	0%		

REFINED GROWTH: 2008 TO 2035

			300	410		
			v	^		
	1150	<			<	870
	1254	>			>	1122
			v	^		
			97	126		

PRORATED GROWTH: 2012 TO 2035
23 YEARS

			260	350		
			v	^		
	980	<			<	740
	1070	>			>	960
			v	^		
			80	110		

NEW PROJECTED VOLUMES: 2035

			510	600		
			v	^		
	1680	<	IN =	3850	<	1440
	1580	>	OUT =	4030	>	1550
			v	^	*	
			200	320		

PM

EXISTING COUNT YEAR: 2012

			362	340		
			v	^		
	645	<	IN =	2146	<	610
	879	>	OUT =	2146	>	957
			v	^		
			204	295		

MIN = Minimum Count Growth Approach
ADD = Additive (Growth Increment) Approach
MUL = Multiplicative (Ratio) Approach

			MUL	ADD		
			v	^		
	MUL	<			<	MUL
	ADD	>			>	ADD
			v	^		
			MUL	MUL		

			0%	0%		
			v	^		
	0%	<			<	0%
	0%	>			>	0%
			v	^		
			0%	0%		

ADJUSTED GROWTH: 2008 TO 2035

			618	440		
			v	^		
	1425	<			<	1010
	1640	>			>	1180
			v	^		
			176	145		

PRORATED GROWTH: 2012 TO 2035
23 YEARS

			530	370		
			v	^		
	1210	<			<	860
	1400	>			>	1010
			v	^		
			150	120		

NEW PROJECTED VOLUMES: 2035

			890	735		
			v	^		
	1925	<	IN =	5060	<	1470
	2280	>	OUT =	5060	>	2038
			v	^	*	
			362	420		

* NOTE: Outbound future volume may be factored (increased) to match inbound if inbound is greater than outbound.

U:\UcJobs_09100-09500_09200\09210\Post Processing\[10 Etiwanda_Limonite.xls] Growth Summary (2)

Project: Vernola Marketplace Apartments TIA
Scenario: 2035 With Project

Job #: 09210
Analyst: CHS
Date: 5/28/14

LOCATION: Etiwanda Avenue / Limonite Avenue
FORECAST YEAR: 2035

INDIVIDUAL TURN VOLUME GROWTH REVIEW

		AM PEAK HOUR INPUT DATA				PM PEAK HOUR INPUT DATA			
APPROACH	TURNING MOVEMENT	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE	EXISTING COUNT	FUTURE VOLUME	DIFF-ERENCE	% CHANGE
NORTH BOUND	Left	27	60	33	122%	49	127	78	159%
	Through	89	144	55	62%	110	152	42	38%
	Right	98	130	32	33%	136	139	3	2%
	NB Total	214	334	120	56%	295	418	123	42%
SOUTH BOUND	Left	81	137	56	69%	96	144	48	50%
	Through	67	105	38	57%	129	233	104	81%
	Right	105	294	189	180%	137	522	385	281%
	SB Total	253	536	283	112%	362	899	537	148%
EAST BOUND	Left	83	317	234	282%	135	441	306	227%
	Through	409	1,283	874	214%	725	1,755	1,030	142%
	Right	14	41	27	193%	19	55	36	189%
	EB Total	506	1,641	1,135	224%	879	2,251	1,372	156%
WEST BOUND	Left	42	54	12	29%	56	74	18	32%
	Through	572	1,326	754	132%	459	1,276	817	178%
	Right	82	139	57	70%	95	141	46	48%
	WB Total	696	1,519	823	118%	610	1,491	881	144%
TOTAL ENTERING VOLUME		1,669	4,030	2361	141%	2,146	5,059	2913	136%

FORECAST PEAK HOUR TO ADT COMPARISON

		VOLUMES		PERCENT OF ADT		
		AM	PM	AM	PM	ADT
North Leg	Inbound	536	899			
North Leg	Outbound	600	734			
North Leg	**TOTAL**	**1,136**	**1,633**	**9%**	**12%**	**13,200**
South Leg	Inbound	334	418			
South Leg	Outbound	200	362			
South Leg	**TOTAL**	**534**	**780**	**4%**	**5%**	**14,700**
East Leg	Inbound	1,519	1,491			
East Leg	Outbound	1,550	2,038			
East Leg	**TOTAL**	**3,069**	**3,529**	**6%**	**7%**	**49,500**
West Leg	Inbound	1,641	2,251			
West Leg	Outbound	1,680	1,925			
West Leg	**TOTAL**	**3,321**	**4,176**	**6%**	**7%**	**56,900**
OVERALL TOTAL		***8,060***	***10,118***	**6%**	***8%***	***134,300***

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APPENDIX 5.1:

EXISTING PLUS PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Intersection Level Of Service Report
#86: Hamner Avenue / 68th Street

Control Type:	Signalized	Delay (sec / veh):	38.9
Analysis Method:	HCM2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.518

Intersection Setup

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	280.00	100.00	100.00	250.00	100.00	100.00	200.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Base Volume Input [veh/h]	45	646	151	51	497	38	108	175	76	223	170	78
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	4	4	0	0	0	2	0	16	8	16
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	62	0	0	18	0	0	18	0	0	32
Total Hourly Volume [veh/h]	45	646	93	55	497	20	108	177	58	239	178	62
Peak Hour Factor	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	184	26	16	141	6	31	50	16	68	51	18
Total Analysis Volume [veh/h]	51	735	106	63	565	23	123	201	66	272	203	71
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0
All red [s]	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Split [s]	12	34	0	12	34	0	23	34	0	25	36	0
Vehicle Extension [s]	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	L	C	R
L, Total Lost Time per Cycle [s]	5.00	7.00	7.00	5.00	7.00	7.00	5.00	7.00	5.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	5.00	5.00	3.00	5.00	5.00	3.00	5.00	3.00	5.00	5.00
g_i, Effective Green Time [s]	5	36	36	6	36	36	10	20	20	30	30
g / C, Green / Cycle	0.05	0.34	0.34	0.06	0.34	0.34	0.09	0.19	0.19	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.03	0.14	0.14	0.04	0.10	0.10	0.08	0.17	0.17	0.12	0.05
s, saturation flow rate [veh/h]	1597	3192	1545	1597	3192	1636	1597	1606	1597	1676	1425
c, Capacity [veh/h]	82	1086	526	89	1100	564	147	305	296	474	403
d1, Uniform Delay [s]	48.78	26.57	26.62	48.70	25.06	25.08	46.85	41.31	42.01	30.72	28.42
k, delay calibration	0.04	0.50	0.50	0.04	0.50	0.50	0.04	0.25	0.30	0.23	0.23
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.80	1.16	2.43	3.73	0.67	1.33	4.63	16.01	24.61	1.31	0.44
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

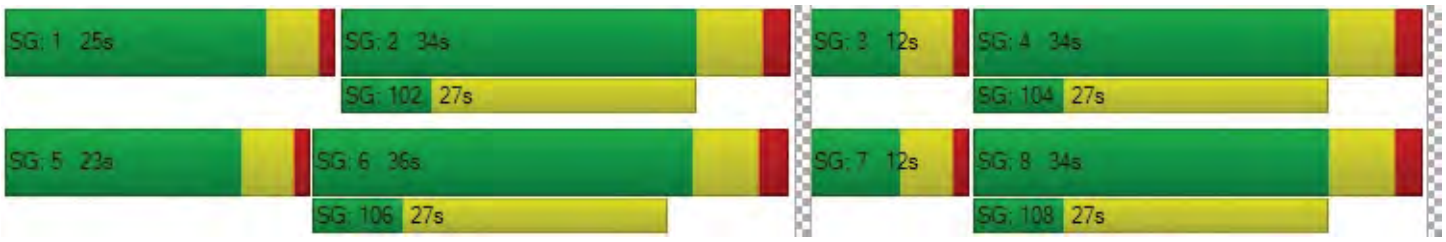
X, volume / capacity	0.62	0.41	0.42	0.70	0.29	0.29	0.83	0.88	0.92	0.43	0.18
d, Delay for Lane Group [s/veh]	51.58	27.72	29.05	52.43	25.74	26.41	51.49	57.32	66.62	32.03	28.86
Lane Group LOS	D	C	C	D	C	C	D	E	E	C	C
Critical Lane Group	no	no	yes	yes	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	1.33	4.26	4.36	1.66	2.89	3.08	3.24	7.78	8.64	4.18	1.35
50th-Percentile Queue Length [ft]	33.34	106.42	109.01	41.61	72.14	77.11	81.05	194.55	215.93	104.43	33.63
95th-Percentile Queue Length [veh]	2.40	7.64	7.79	3.00	5.19	5.55	5.84	12.36	13.46	7.52	2.42
95th-Percentile Queue Length [ft]	60.01	191.01	194.63	74.91	129.85	138.79	145.90	308.92	336.43	187.98	60.53

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.58	27.99	29.05	52.43	25.94	26.41	51.49	57.32	57.32	66.62	32.03	28.86
Movement LOS	D	C	C	D	C	C	D	E	E	E	C	C
d_A, Approach Delay [s/veh]	29.82			28.99			55.48			48.85		
Approach LOS	C			C			E			D		
d_I, Intersection Delay [s/veh]	38.87											
Intersection LOS	D											
Intersection V/C	0.518											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	965	423	610	584	0	0	0	0	126	0	428
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0.0	182.7	182.7	184.5	175.9	0.0				179.2	182.5	182.7
Adj Flow Rate, veh/h	0	995	436	629	602	0				87	0	487
Adj No. of Lanes	0	2	1	2	2	0				1	0	2
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	4	4	3	8	0				6	0	4
Cap, veh/h	0	1593	713	723	2387	0				308	0	556
Arrive On Green	0.00	0.46	0.46	0.07	0.24	0.00				0.18	0.00	0.18
Sat Flow, veh/h	0	3563	1553	3408	3431	0				1707	0	3080
Grp Volume(v), veh/h	0	995	436	629	602	0				87	0	487
Grp Sat Flow(s),veh/h/ln	0	1736	1553	1704	1671	0				1707	0	1540
Q Serve(g_s), s	0.0	22.7	22.0	19.1	15.3	0.0				4.6	0.0	16.1
Cycle Q Clear(g_c), s	0.0	22.7	22.0	19.1	15.3	0.0				4.6	0.0	16.1
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1593	713	723	2387	0				308	0	556
V/C Ratio(X)	0.00	0.62	0.61	0.87	0.25	0.00				0.28	0.00	0.88
Avail Cap(c_a), veh/h	0	1593	713	1160	2387	0				401	0	723
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.53	0.53	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	21.4	21.2	47.1	17.2	0.0				36.9	0.0	41.6
Incr Delay (d2), s/veh	0.0	0.6	1.1	1.4	0.1	0.0				0.2	0.0	8.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.9	9.7	9.2	7.1	0.0				2.2	0.0	7.4
LnGrp Delay(d),s/veh	0.0	22.0	22.4	48.5	17.4	0.0				37.1	0.0	49.6
LnGrp LOS		C	C	D	B					D		D
Approach Vol, veh/h		1431			1231						574	
Approach Delay, s/veh		22.1			33.3						47.7	
Approach LOS		C			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	26.6	53.4		24.3		80.0		
Change Period (Y+Rc), s	4.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	35.5	34.5		24.5		74.5		
Max Q Clear Time (g_c+I1), s	21.1	24.7		18.1		17.3		
Green Ext Time (p_c), s	1.1	5.4		0.8		9.5		

Intersection Summary	
HCM 2010 Ctrl Delay	30.9
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	666	425	0	0	989	354	205	2	280	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	182.7	179.2	0.0	0.0	181.0	182.7	174.3	179.6	181.0			
Adj Flow Rate, veh/h	716	457	0	0	1063	381	327	0	188			
Adj No. of Lanes	2	2	0	0	2	1	2	0	1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	4	6	0	0	5	4	9	0	5			
Cap, veh/h	815	2307	0	0	1358	611	740	0	343			
Arrive On Green	0.24	0.68	0.00	0.00	0.40	0.40	0.22	0.00	0.22			
Sat Flow, veh/h	3375	3495	0	0	3529	1547	3320	0	1538			
Grp Volume(v), veh/h	716	457	0	0	1063	381	327	0	188			
Grp Sat Flow(s),veh/h/ln	1688	1703	0	0	1719	1547	1660	0	1538			
Q Serve(g_s), s	22.5	5.5	0.0	0.0	29.8	21.7	9.3	0.0	11.9			
Cycle Q Clear(g_c), s	22.5	5.5	0.0	0.0	29.8	21.7	9.3	0.0	11.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	815	2307	0	0	1358	611	740	0	343			
V/C Ratio(X)	0.88	0.20	0.00	0.00	0.78	0.62	0.44	0.00	0.55			
Avail Cap(c_a), veh/h	1089	2307	0	0	1358	611	740	0	343			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.75	0.75	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	40.2	6.6	0.0	0.0	29.1	26.7	36.9	0.0	37.9			
Incr Delay (d2), s/veh	5.1	0.1	0.0	0.0	4.6	4.7	1.9	0.0	6.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	11.0	2.6	0.0	0.0	14.9	10.1	4.5	0.0	5.7			
LnGrp Delay(d),s/veh	45.2	6.8	0.0	0.0	33.7	31.5	38.8	0.0	44.1			
LnGrp LOS	D	A			C	C	D		D			
Approach Vol, veh/h		1173			1444			515				
Approach Delay, s/veh		30.2			33.1			40.7				
Approach LOS		C			C			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		80.0			31.0	49.0		30.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.5
Max Green Setting (Gmax), s		74.5			35.5	34.5		24.5
Max Q Clear Time (g_c+I1), s		7.5			24.5	31.8		13.9
Green Ext Time (p_c), s		8.8			2.1	1.9		1.4

Intersection Summary	
HCM 2010 Ctrl Delay	33.3
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Intersection Level Of Service Report
#89: Pats Ranch Road / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	11.9
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.461

Intersection Setup

Name	Pats Ranch Road		Limonite Avenue		Limonite Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	210.00	100.00	100.00	100.00	170.00	100.00
Speed [mph]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	yes		no		no	

Volumes

Name	Pats Ranch Road		Limonite Avenue		Limonite Avenue	
Base Volume Input [veh/h]	328	49	600	90	55	933
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	82	24	0	20	6	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	35	0	42	0	0
Total Hourly Volume [veh/h]	410	38	600	68	61	933
Peak Hour Factor	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	111	10	163	18	17	253
Total Analysis Volume [veh/h]	445	41	651	74	66	1013
Presence of On-Street Parking	no	no	no	no	no	no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Protected	Permissive
Signal Group	3	0	2	0	1	6
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	6	0	6	0	5	6
Maximum Green [s]	0	0	0	0	0	0
Amber [s]	3.6	0.0	4.7	0.0	3.2	4.7
All red [s]	1.0	0.0	1.0	0.0	1.0	1.0
Split [s]	15	0	30	0	15	45
Vehicle Extension [s]	2.5	0.0	3.0	0.0	1.5	3.0
Walk [s]	0	0	11	0	0	0
Pedestrian Clearance [s]	0	0	13	0	0	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.6	0.0	3.7	0.0	2.2	3.7
Minimum Recall	no		no		no	no
Maximum Recall	no		yes		no	yes
Pedestrian Recall	no		no		no	no
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	R	C	R	L	C
L, Total Lost Time per Cycle [s]	4.60	4.60	5.70	5.70	4.20	5.70
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	3.70	3.70	2.20	3.70
g_i, Effective Green Time [s]	10	10	32	32	3	39
g / C, Green / Cycle	0.17	0.17	0.53	0.53	0.06	0.66
(v / s)_i Volume / Saturation Flow Rate	0.14	0.03	0.20	0.05	0.04	0.32
s, saturation flow rate [veh/h]	3101	1425	3192	1425	1597	3192
c, Capacity [veh/h]	528	243	1699	759	88	2099
d1, Uniform Delay [s]	24.04	21.20	8.22	6.90	27.87	5.14
k, delay calibration	0.08	0.08	0.50	0.50	0.04	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.81	0.24	0.66	0.26	4.81	0.80
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

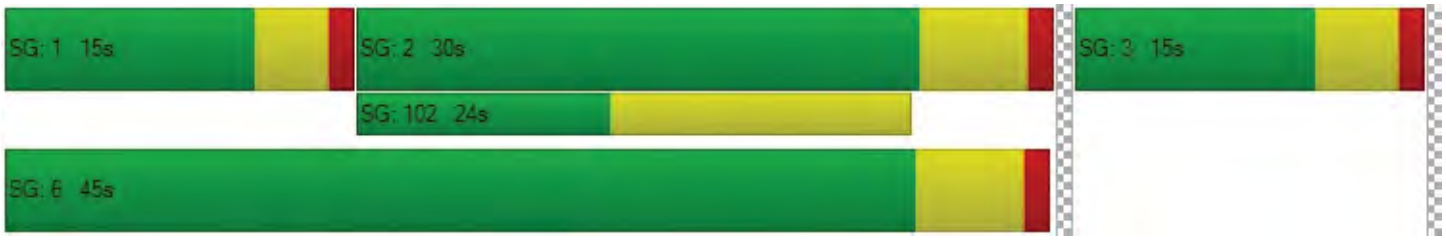
X, volume / capacity	0.84	0.17	0.38	0.10	0.75	0.48
d, Delay for Lane Group [s/veh]	26.85	21.44	8.87	7.15	32.68	5.94
Lane Group LOS	C	C	A	A	C	A
Critical Lane Group	yes	no	no	no	no	yes
50th-Percentile Queue Length [veh]	2.98	0.47	1.88	0.38	0.95	1.82
50th-Percentile Queue Length [ft]	74.53	11.68	47.12	9.61	23.86	45.61
95th-Percentile Queue Length [veh]	5.37	0.84	3.39	0.69	1.72	3.28
95th-Percentile Queue Length [ft]	134.16	21.02	84.81	17.29	42.94	82.10

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	26.85	21.44	8.87	7.15	32.68	5.94
Movement LOS	C	C	A	A	C	A
d_A, Approach Delay [s/veh]	26.40		8.70		7.57	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	11.92					
Intersection LOS	B					
Intersection V/C	0.461					

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
#90: Pats Ranch Road / 65th Street

Control Type:	Signalized	Delay (sec / veh):	10.9
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.188

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	90.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Base Volume Input [veh/h]	44	246	30	7	119	0	19	5	19	41	6	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	114	0	0	28	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	3	0	0	0	0	0	16	0	0	24
Total Hourly Volume [veh/h]	44	360	27	7	147	0	19	5	3	41	6	9
Peak Hour Factor	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	109	8	2	45	0	6	2	1	12	2	3
Total Analysis Volume [veh/h]	53	437	33	8	178	0	23	6	4	50	7	11
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	0	1	6	0	0	4	0	0	8	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.6	3.6	0.0	3.6	3.6	0.0	0.0	3.6	0.0	0.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	16	27	0	16	27	0	0	27	0	0	27	0
Vehicle Extension [s]	2.5	2.5	0.0	2.5	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	15	0	0	15	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.6	2.6	0.0	2.6	2.6	0.0	0.0	2.6	0.0	0.0	2.6	0.0
Minimum Recall	no	no		no	no			no			no	
Maximum Recall	no	yes		no	yes			no			no	
Pedestrian Recall	no	no		no	no			no			no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	4	50	50	1	46	46	5	5	5	5
g / C, Green / Cycle	0.06	0.71	0.71	0.01	0.66	0.66	0.08	0.08	0.08	0.08
(v / s)_i Volume / Saturation Flow Rate	0.03	0.11	0.11	0.01	0.06	0.00	0.02	0.01	0.08	0.01
s, saturation flow rate [veh/h]	1597	1676	1622	1597	3192	1425	1263	1566	753	1425
c, Capacity [veh/h]	102	1196	1157	23	2118	946	103	118	153	107
d1, Uniform Delay [s]	31.68	3.22	3.22	34.13	4.19	0.00	34.95	30.08	33.18	30.12
k, delay calibration	0.08	0.50	0.50	0.08	0.50	0.50	0.08	0.08	0.08	0.08
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.03	0.26	0.27	6.74	0.08	0.00	0.80	0.23	1.11	0.31
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.52	0.15	0.15	0.35	0.08	0.00	0.22	0.08	0.37	0.10
d, Delay for Lane Group [s/veh]	34.71	3.48	3.50	40.87	4.27	0.00	35.75	30.31	34.29	30.43
Lane Group LOS	C	A	A	D	A	A	D	C	C	C
Critical Lane Group	no	no	yes	yes	no	no	no	no	yes	no
50th-Percentile Queue Length [veh]	0.91	0.58	0.57	0.17	0.35	0.00	0.42	0.16	1.00	0.18
50th-Percentile Queue Length [ft]	22.80	14.57	14.28	4.29	8.71	0.00	10.38	4.03	24.88	4.47
95th-Percentile Queue Length [veh]	1.64	1.05	1.03	0.31	0.63	0.00	0.75	0.29	1.79	0.32
95th-Percentile Queue Length [ft]	41.04	26.22	25.70	7.72	15.67	0.00	18.68	7.26	44.78	8.04

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.71	3.49	3.50	40.87	4.27	0.00	35.75	30.31	30.31	34.29	34.29	30.43
Movement LOS	C	A	A	D	A	A	D	C	C	C	C	C
d_A, Approach Delay [s/veh]	7.58			5.84			34.10			33.67		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	10.94											
Intersection LOS	B											
Intersection V/C	0.188											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

The delay reported in the traffic study is higher than that calculated in this worksheet as the calculated delay is lower than the comparable previous scenario. This is due to the HCM 2010 methodology which reports delay as the average delay of all vehicles at the intersection. The lower delay in this scenario is due to the fact that the added volumes are to movements experiencing lower delays than most.

Intersection Level Of Service Report
#91: Pats Ranch Road / Driveway 1

Control Type:	Two-way stop	Delay (sec / veh):	9.0
Analysis Method:	HCM2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.022

Intersection Setup

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	150.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		yes	

Volumes

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Base Volume Input [veh/h]	0	320	179	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	114	14	14	0	18
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	434	193	14	0	18
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	118	52	4	0	5
Total Analysis Volume [veh/h]	0	472	210	15	0	20
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.02
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	9.00
Movement LOS		A	A	A		A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.07
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	1.67
d_A, Approach Delay [s/veh]	0.00		0.00		9.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.25					
Intersection LOS	A					

Intersection Level Of Service Report
#92: Pats Ranch Road / Ivory Street

Control Type:	Two-way stop	Delay (sec / veh):	18.5
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 2			Ivory Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	150.00	100.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 2			Ivory Street		
Base Volume Input [veh/h]	0	237	48	33	146	0	0	0	0	72	0	83
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	12	0	0	0	18	14	114	0	30	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	237	48	33	164	14	114	0	30	72	0	83
Peak Hour Factor	0.6820	0.6820	0.6820	0.6820	0.6820	0.6820	0.6820	0.6820	0.6820	0.6820	0.6820	0.6820
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	87	18	12	60	5	42	0	11	26	0	30
Total Analysis Volume [veh/h]	18	348	70	48	240	21	167	0	44	106	0	122
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			no	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			yes	yes
Number of Storage Spaces in Median	0	0	2	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.04	0.00	0.00	0.37	0.00	0.05	0.23	0.00	0.15
d_M, Delay for Movement [s/veh]	7.81	0.00	0.00	8.30	0.00	0.00	18.07	18.49	14.10	14.86	15.12	10.33
Movement LOS	A	A	A	A	A	A	C	C	B	B	C	B
95th-Percentile Queue Length [veh]	0.04	0.00	0.00	0.13	0.00	0.00	2.05	2.05	2.05	0.86	0.86	0.54
95th-Percentile Queue Length [ft]	1.05	0.00	0.00	3.30	0.00	0.00	51.35	51.35	51.35	21.40	21.40	13.47
d_A, Approach Delay [s/veh]	0.32			1.29			17.24			12.44		
Approach LOS	A			A			C			B		
d_I, Intersection Delay [s/veh]	5.92											
Intersection LOS	C											

Intersection Level Of Service Report
#93: Pats Ranch Road / 68th Street

Control Type:	All-way stop	Delay (sec / veh):	56.0
Analysis Method:	HCM2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Pats Ranch Road		68th Street		68th Street	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1
Pocket Length [ft]	100.00	100.00	200.00	100.00	100.00	220.00
Speed [mph]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	yes		no		no	

Volumes

Name	Pats Ranch Road		68th Street		68th Street	
Base Volume Input [veh/h]	25	193	250	407	379	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	40	10	0	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	233	260	407	379	37
Peak Hour Factor	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	79	88	138	128	13
Total Analysis Volume [veh/h]	45	315	352	551	513	50
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.38	5.15	7.27	20.45	3.56	3.56	0.34
95th-Percentile Queue Length [ft]	9.47	128.70	181.80	511.21	88.98	88.98	8.54
Approach Delay [s/veh]	24.56		90.76		20.38		
Approach LOS	C		F		C		
Intersection Delay [s/veh]	56.01						
Intersection LOS	F						

Intersection Level Of Service Report
#94: Wineville Avenue / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	19.0
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.371

Intersection Setup

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Pocket Length [ft]	185.00	100.00	100.00	100.00	100.00	100.00	250.00	100.00	360.00	245.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Base Volume Input [veh/h]	56	105	46	40	77	120	69	532	48	26	812	29
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	24	0	0	6	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	24	0	0	0
Total Hourly Volume [veh/h]	56	105	46	40	77	120	69	556	24	26	818	29
Peak Hour Factor	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	28	12	11	21	32	18	148	6	7	218	8
Total Analysis Volume [veh/h]	60	112	49	43	82	128	74	593	26	28	872	31
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	26.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	5	0	4	5	0	4	6	0	4	6	0
Maximum Green [s]	37	58	0	37	58	0	20	0	0	75	0	0
Amber [s]	3.0	4.3	0.0	3.0	4.3	0.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0
Split [s]	11	32	0	11	32	0	9	29	0	8	28	0
Vehicle Extension [s]	1.5	2.0	0.0	1.5	2.0	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Walk [s]	0	5	0	0	5	0	0	10	0	0	10	0
Pedestrian Clearance [s]	0	21	0	0	16	0	0	13	0	0	12	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	1.5	3.3	0.0	1.5	3.3	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	no		no	no		no	yes		no	yes	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	L	C	R	L	C	C
L, Total Lost Time per Cycle [s]	3.50	5.30	5.30	3.50	5.30	3.50	6.00	6.00	3.50	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.50	3.30	3.30	1.50	3.30	1.50	4.00	4.00	1.50	4.00	4.00
g_i, Effective Green Time [s]	3	13	13	2	12	4	45	45	2	42	42
g / C, Green / Cycle	0.04	0.16	0.16	0.03	0.15	0.05	0.56	0.56	0.02	0.53	0.53
(v / s)_i Volume / Saturation Flow Rate	0.03	0.04	0.04	0.02	0.12	0.04	0.17	0.02	0.02	0.17	0.17
s, saturation flow rate [veh/h]	1774	1863	1663	1774	1682	1774	3547	1583	1774	1863	1831
c, Capacity [veh/h]	78	300	268	56	250	96	1968	879	43	978	961
d1, Uniform Delay [s]	37.90	29.38	29.46	38.51	33.18	37.40	9.53	8.07	38.75	10.89	10.89
k, delay calibration	0.04	0.04	0.04	0.04	0.04	0.04	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.89	0.16	0.20	8.11	2.92	4.86	0.39	0.06	6.04	0.88	0.90
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.77	0.25	0.27	0.77	0.84	0.77	0.30	0.03	0.65	0.32	0.32
d, Delay for Lane Group [s/veh]	43.79	29.54	29.66	46.62	36.10	42.26	9.92	8.13	44.79	11.77	11.79
Lane Group LOS	D	C	C	D	D	D	A	A	D	B	B
Critical Lane Group	yes	no	no	no	yes	yes	no	no	no	no	yes
50th-Percentile Queue Length [veh]	1.23	1.20	1.15	0.92	3.89	1.48	2.35	0.18	0.58	2.73	2.69
50th-Percentile Queue Length [ft]	30.67	29.97	28.71	22.95	97.32	36.97	58.83	4.55	14.38	68.29	67.22
95th-Percentile Queue Length [veh]	2.21	2.16	2.07	1.65	7.01	2.66	4.24	0.33	1.04	4.92	4.84
95th-Percentile Queue Length [ft]	55.20	53.95	51.69	41.30	175.17	66.55	105.90	8.19	25.89	122.93	121.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	43.79	29.57	29.66	46.62	36.10	36.10	42.26	9.92	8.13	44.79	11.78	11.79
Movement LOS	D	C	C	D	D	D	D	A	A	D	B	B
d_A, Approach Delay [s/veh]	33.71			37.89			13.31			13.19		
Approach LOS	C			D			B			B		
d_I, Intersection Delay [s/veh]	19.03											
Intersection LOS	B											
Intersection V/C	0.371											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

The delay reported in the traffic study is higher than that calculated in this worksheet as the calculated delay is lower than the comparable previous scenario. This is due to the HCM 2010 methodology which reports delay as the average delay of all vehicles at the intersection. The lower delay in this scenario is due to the fact that the added volumes are to movements experiencing lower delays than most.

Intersection Level Of Service Report
#86: Hamner Avenue / 68th Street

Control Type:	Signalized	Delay (sec / veh):	30.0
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.396

Intersection Setup

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	280.00	100.00	100.00	250.00	100.00	100.00	200.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Base Volume Input [veh/h]	49	631	182	45	537	71	56	91	38	157	143	72
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	16	16	0	0	0	8	0	9	4	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	72	0	0	16	0	0	10	0	0	38
Total Hourly Volume [veh/h]	49	631	126	61	537	55	56	99	28	166	147	43
Peak Hour Factor	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	178	36	17	152	16	16	28	8	47	42	12
Total Analysis Volume [veh/h]	55	713	142	69	607	62	63	112	32	188	166	49
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0
All red [s]	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Split [s]	12	34	0	12	34	0	17	34	0	20	37	0
Vehicle Extension [s]	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	L	C	R
L, Total Lost Time per Cycle [s]	5.00	7.00	7.00	5.00	7.00	7.00	5.00	7.00	5.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	5.00	5.00	3.00	5.00	5.00	3.00	5.00	3.00	5.00	5.00
g_i, Effective Green Time [s]	5	45	45	6	46	46	6	11	13	19	19
g / C, Green / Cycle	0.05	0.45	0.45	0.06	0.46	0.46	0.06	0.11	0.13	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.03	0.14	0.15	0.04	0.12	0.12	0.04	0.09	0.12	0.10	0.03
s, saturation flow rate [veh/h]	1597	3192	1505	1597	3192	1583	1597	1613	1597	1676	1425
c, Capacity [veh/h]	87	1453	685	95	1469	728	92	180	214	314	267
d1, Uniform Delay [s]	46.25	17.32	17.36	46.19	16.46	16.49	46.19	43.33	42.49	36.62	34.17
k, delay calibration	0.04	0.50	0.50	0.04	0.50	0.50	0.04	0.23	0.18	0.23	0.23
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.77	0.57	1.24	3.89	0.41	0.84	3.31	15.94	17.04	2.93	0.70
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

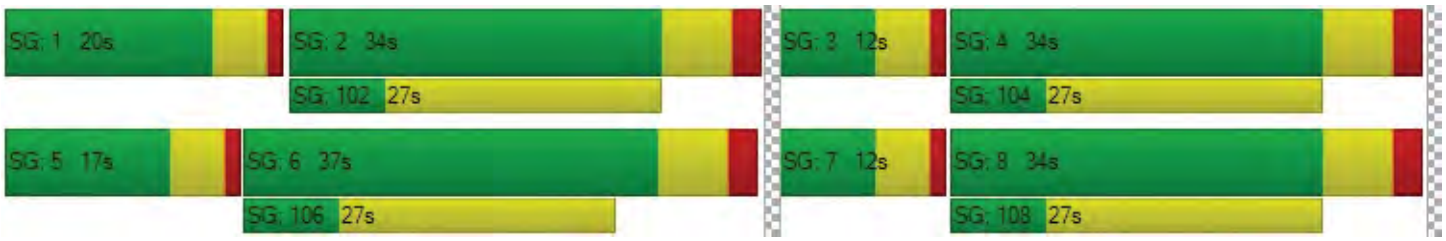
X, volume / capacity	0.63	0.32	0.32	0.73	0.25	0.25	0.68	0.80	0.88	0.53	0.18
d, Delay for Lane Group [s/veh]	49.02	17.89	18.60	50.07	16.87	17.32	49.50	59.27	59.54	39.54	34.86
Lane Group LOS	D	B	B	D	B	B	D	E	E	D	C
Critical Lane Group	no	no	yes	yes	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	1.36	3.22	3.21	1.73	2.46	2.56	1.57	4.13	5.37	3.75	1.01
50th-Percentile Queue Length [ft]	33.98	80.53	80.35	43.22	61.49	64.07	39.17	103.31	134.34	93.81	25.37
95th-Percentile Queue Length [veh]	2.45	5.80	5.79	3.11	4.43	4.61	2.82	7.44	9.18	6.75	1.83
95th-Percentile Queue Length [ft]	61.17	144.96	144.63	77.79	110.68	115.33	70.51	185.96	229.38	168.85	45.67

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	49.02	17.99	18.60	50.07	16.98	17.32	49.50	59.27	59.27	59.54	39.54	34.86
Movement LOS	D	B	B	D	B	B	D	E	E	E	D	C
d_A, Approach Delay [s/veh]	20.44			20.69			56.30			48.30		
Approach LOS	C			C			E			D		
d_I, Intersection Delay [s/veh]	30.01											
Intersection LOS	C											
Intersection V/C	0.396											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
#90: Pats Ranch Road / 65th Street

Control Type:	Signalized	Delay (sec / veh):	10.6
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.255

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	90.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Base Volume Input [veh/h]	50	184	23	34	202	5	22	2	24	18	7	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	59	0	0	112	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	18	0	0	18
Total Hourly Volume [veh/h]	50	243	23	34	314	5	22	2	6	18	7	3
Peak Hour Factor	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	81	8	11	104	2	7	1	2	6	2	1
Total Analysis Volume [veh/h]	66	323	31	45	417	7	29	3	8	24	9	4
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	0	1	6	0	0	4	0	0	8	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.6	3.6	0.0	3.6	3.6	0.0	0.0	3.6	0.0	0.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	12	27	0	12	27	0	0	31	0	0	31	0
Vehicle Extension [s]	2.5	2.5	0.0	2.5	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	15	0	0	15	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.6	2.6	0.0	2.6	2.6	0.0	0.0	2.6	0.0	0.0	2.6	0.0
Minimum Recall	no	no		no	no			no			no	
Maximum Recall	no	yes		no	yes			no			no	
Pedestrian Recall	no	no		no	no			no			no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	5	48	48	4	48	48	4	4	4	4
g / C, Green / Cycle	0.07	0.69	0.69	0.06	0.68	0.68	0.05	0.05	0.05	0.05
(v / s)_i Volume / Saturation Flow Rate	0.04	0.09	0.09	0.03	0.13	0.00	0.02	0.01	0.08	0.00
s, saturation flow rate [veh/h]	1597	1676	1613	1597	3192	1425	1260	1486	396	1425
c, Capacity [veh/h]	114	1164	1120	92	2172	970	103	75	109	72
d1, Uniform Delay [s]	31.38	3.56	3.57	31.90	4.10	3.58	34.89	31.69	34.45	31.55
k, delay calibration	0.08	0.50	0.50	0.08	0.50	0.50	0.08	0.08	0.08	0.08
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.42	0.22	0.23	2.99	0.20	0.01	1.08	0.66	1.14	0.24
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

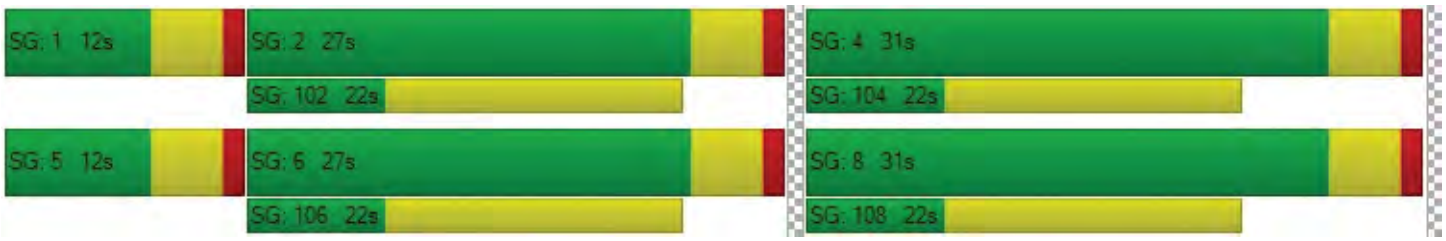
X, volume / capacity	0.58	0.12	0.12	0.49	0.19	0.01	0.28	0.15	0.30	0.06
d, Delay for Lane Group [s/veh]	34.81	3.78	3.79	34.89	4.30	3.59	35.97	32.35	35.59	31.78
Lane Group LOS	C	A	A	C	A	A	D	C	D	C
Critical Lane Group	yes	no	no	no	yes	no	no	no	yes	no
50th-Percentile Queue Length [veh]	1.13	0.51	0.50	0.78	0.80	0.03	0.53	0.19	0.59	0.07
50th-Percentile Queue Length [ft]	28.37	12.80	12.55	19.48	20.09	0.64	13.20	4.71	14.79	1.70
95th-Percentile Queue Length [veh]	2.04	0.92	0.90	1.40	1.45	0.05	0.95	0.34	1.06	0.12
95th-Percentile Queue Length [ft]	51.07	23.03	22.58	35.07	36.16	1.15	23.77	8.48	26.61	3.06

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.81	3.79	3.79	34.89	4.30	3.59	35.97	32.35	32.35	35.59	35.59	31.78
Movement LOS	C	A	A	C	A	A	D	C	C	D	D	C
d_A, Approach Delay [s/veh]	9.67			7.22			34.98			35.18		
Approach LOS	A			A			C			D		
d_I, Intersection Delay [s/veh]	10.57											
Intersection LOS	B											
Intersection V/C	0.255											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



The delay reported in the traffic study is higher than that calculated in this worksheet as the calculated delay is lower than the comparable previous scenario. This is due to the HCM 2010 methodology which reports delay as the average delay of all vehicles at the intersection. The lower delay in this scenario is due to the fact that the added volumes are to movements experiencing lower delays than most.

Intersection Level Of Service Report
#91: Pats Ranch Road / Driveway 1

Control Type:	Two-way stop	Delay (sec / veh):	9.5
Analysis Method:	HCM2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.013

Intersection Setup

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	150.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		yes	

Volumes

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Base Volume Input [veh/h]	0	257	244	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	59	56	56	0	10
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	316	300	56	0	10
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	86	82	15	0	3
Total Analysis Volume [veh/h]	0	343	326	61	0	11
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	9.48
Movement LOS		A	A	A		A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.04
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	1.03
d_A, Approach Delay [s/veh]	0.00		0.00		9.48	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.14					
Intersection LOS	A					

Intersection Level Of Service Report
#92: Pats Ranch Road / Ivory Street

Control Type:	Two-way stop	Delay (sec / veh):	19.5
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.263

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 2			Ivory Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	150.00	100.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 2			Ivory Street		
Base Volume Input [veh/h]	0	165	63	49	195	0	0	0	0	64	0	92
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	48	0	0	0	10	56	59	0	16	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	48	165	63	49	205	56	59	0	16	64	0	92
Peak Hour Factor	0.6630	0.6630	0.6630	0.6630	0.6630	0.6630	0.6630	0.6630	0.6630	0.6630	0.6630	0.6630
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	62	24	18	77	21	22	0	6	24	0	35
Total Analysis Volume [veh/h]	72	249	95	74	309	84	89	0	24	97	0	139
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			no	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			yes	yes
Number of Storage Spaces in Median	0	0	2	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.00	0.00	0.06	0.00	0.00	0.26	0.00	0.03	0.24	0.00	0.17
d_M, Delay for Movement [s/veh]	8.30	0.00	0.00	8.16	0.00	0.00	19.47	19.27	13.25	16.52	18.37	10.12
Movement LOS	A	A	A	A	A	A	C	C	B	C	C	B
95th-Percentile Queue Length [veh]	0.20	0.00	0.00	0.19	0.00	0.00	1.20	1.20	1.20	0.91	0.91	0.59
95th-Percentile Queue Length [ft]	4.95	0.00	0.00	4.87	0.00	0.00	30.00	30.00	30.00	22.78	22.78	14.74
d_A, Approach Delay [s/veh]	1.44			1.29			18.15			12.75		
Approach LOS	A			A			C			B		
d_I, Intersection Delay [s/veh]	5.08											
Intersection LOS	C											

Intersection Level Of Service Report
#93: Pats Ranch Road / 68th Street

Control Type:	All-way stop	Delay (sec / veh):	28.7
Analysis Method:	HCM2010	Level Of Service:	D
Analysis Period:	15 minutes		

Intersection Setup

Name	Pats Ranch Road		68th Street		68th Street	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1
Pocket Length [ft]	100.00	100.00	200.00	100.00	100.00	220.00
Speed [mph]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	yes		no		no	

Volumes

Name	Pats Ranch Road		68th Street		68th Street	
Base Volume Input [veh/h]	28	231	187	253	307	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	4	22	40	0	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	253	227	253	307	49
Peak Hour Factor	0.6780	0.6780	0.6780	0.6780	0.6780	0.6780
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	93	84	93	113	18
Total Analysis Volume [veh/h]	47	373	335	373	453	72
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.39	7.10	6.65	7.53	2.89	2.89	0.52
95th-Percentile Queue Length [ft]	9.64	177.55	166.25	188.20	72.30	72.30	13.09
Approach Delay [s/veh]	30.75		35.10		18.29		
Approach LOS	D		E		C		
Intersection Delay [s/veh]	28.66						
Intersection LOS	D						

Intersection Level Of Service Report
#86: Hamner Avenue / 68th Street

Control Type:	Signalized	Delay (sec / veh):	30.6
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.409

Intersection Setup

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	280.00	100.00	100.00	250.00	100.00	100.00	200.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Base Volume Input [veh/h]	69	636	188	96	561	60	56	106	34	161	129	76
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	16	16	0	0	0	8	0	9	4	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	77	0	0	34	0	0	11	0	0	38
Total Hourly Volume [veh/h]	69	636	127	112	561	26	56	114	23	170	133	47
Peak Hour Factor	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	165	33	29	146	7	15	30	6	44	35	12
Total Analysis Volume [veh/h]	72	660	132	116	583	27	58	118	24	177	138	49
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0
All red [s]	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Split [s]	12	34	0	12	34	0	18	34	0	20	36	0
Vehicle Extension [s]	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	L	C	R
L, Total Lost Time per Cycle [s]	5.00	7.00	7.00	5.00	7.00	7.00	5.00	7.00	5.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	5.00	5.00	3.00	5.00	5.00	3.00	5.00	3.00	5.00	5.00
g_i, Effective Green Time [s]	6	43	43	9	46	46	6	11	13	18	18
g / C, Green / Cycle	0.06	0.44	0.44	0.09	0.46	0.46	0.06	0.11	0.13	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.05	0.14	0.14	0.07	0.11	0.11	0.04	0.09	0.11	0.08	0.03
s, saturation flow rate [veh/h]	1597	3192	1509	1597	3192	1634	1597	1628	1597	1676	1425
c, Capacity [veh/h]	96	1391	657	140	1478	757	89	178	203	302	257
d1, Uniform Delay [s]	46.20	18.41	18.46	44.84	16.22	16.24	46.22	43.43	42.82	36.57	34.76
k, delay calibration	0.04	0.50	0.50	0.04	0.50	0.50	0.04	0.23	0.15	0.23	0.23
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.25	0.59	1.27	4.67	0.39	0.77	2.95	15.82	14.23	2.29	0.76
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

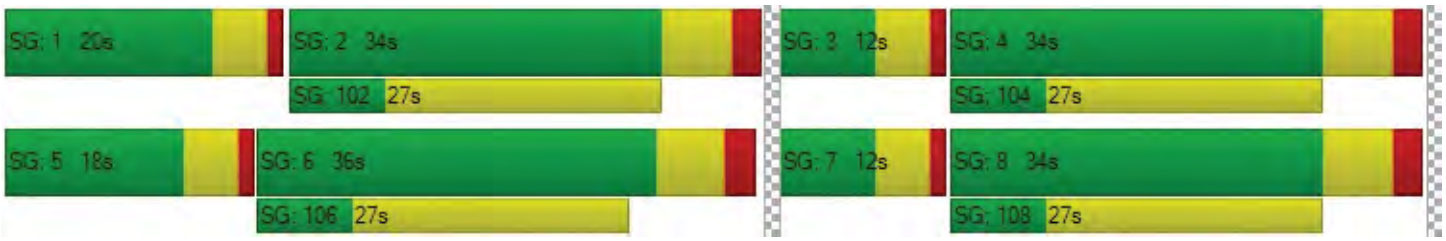
X, volume / capacity	0.75	0.31	0.32	0.83	0.24	0.24	0.65	0.80	0.87	0.46	0.19
d, Delay for Lane Group [s/veh]	50.45	19.00	19.74	49.51	16.61	17.00	49.17	59.25	57.05	38.86	35.52
Lane Group LOS	D	B	B	D	B	B	D	E	E	D	D
Critical Lane Group	no	no	yes	yes	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	1.81	3.17	3.18	2.90	2.38	2.53	1.44	4.07	4.91	3.08	1.03
50th-Percentile Queue Length [ft]	45.30	79.23	79.43	72.59	59.46	63.30	35.91	101.84	122.87	76.90	25.69
95th-Percentile Queue Length [veh]	3.26	5.70	5.72	5.23	4.28	4.56	2.59	7.33	8.55	5.54	1.85
95th-Percentile Queue Length [ft]	81.55	142.61	142.97	130.66	107.03	113.94	64.63	183.32	213.76	138.41	46.23

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	50.45	19.11	19.74	49.51	16.73	17.00	49.17	59.25	59.25	57.05	38.86	35.52
Movement LOS	D	B	B	D	B	B	D	E	E	E	D	D
d_A, Approach Delay [s/veh]	22.38			22.50			56.33			47.25		
Approach LOS	C			C			E			D		
d_I, Intersection Delay [s/veh]	30.58											
Intersection LOS	C											
Intersection V/C	0.409											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1089	441	432	865	0	0	0	0	248	1	539
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0.0	186.3	186.3	188.1	186.3	0.0				186.3	186.3	186.3
Adj Flow Rate, veh/h	0	1146	464	455	911	0				174	0	661
Adj No. of Lanes	0	2	1	2	2	0				1	0	2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	1	2	0				2	0	2
Cap, veh/h	0	1704	762	538	2397	0				395	0	701
Arrive On Green	0.00	0.48	0.48	0.05	0.22	0.00				0.22	0.00	0.22
Sat Flow, veh/h	0	3632	1583	3476	3632	0				1774	0	3145
Grp Volume(v), veh/h	0	1146	464	455	911	0				174	0	661
Grp Sat Flow(s),veh/h/ln	0	1770	1583	1738	1770	0				1774	0	1573
Q Serve(g_s), s	0.0	27.3	23.6	14.3	24.0	0.0				9.3	0.0	22.7
Cycle Q Clear(g_c), s	0.0	27.3	23.6	14.3	24.0	0.0				9.3	0.0	22.7
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1704	762	538	2397	0				395	0	701
V/C Ratio(X)	0.00	0.67	0.61	0.85	0.38	0.00				0.44	0.00	0.94
Avail Cap(c_a), veh/h	0	1704	762	1122	2397	0				395	0	701
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.70	0.70	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	21.9	20.9	50.9	23.1	0.0				36.8	0.0	42.1
Incr Delay (d2), s/veh	0.0	0.9	1.0	1.0	0.3	0.0				0.3	0.0	21.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.4	10.5	7.0	11.9	0.0				4.6	0.0	11.9
LnGrp Delay(d),s/veh	0.0	22.7	21.9	51.9	23.4	0.0				37.1	0.0	63.1
LnGrp LOS		C	C	D	C					D		E
Approach Vol, veh/h		1610			1366						835	
Approach Delay, s/veh		22.5			32.9						57.7	
Approach LOS		C			C						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	21.5	58.5		30.0		80.0		
Change Period (Y+Rc), s	4.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	35.5	34.5		24.5		74.5		
Max Q Clear Time (g_c+I1), s	16.3	29.3		24.7		26.0		
Green Ext Time (p_c), s	0.8	3.9		0.0		14.1		

Intersection Summary	
HCM 2010 Ctrl Delay	33.9
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	404	933	0	0	965	259	332	17	633	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	184.5	186.3	0.0	0.0	188.1	188.1	186.3	188.0	188.1			
Adj Flow Rate, veh/h	421	972	0	0	1005	270	237	0	788			
Adj No. of Lanes	2	2	0	0	2	1	1	0	2			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	2	0	0	1	1	2	0	1			
Cap, veh/h	512	2397	0	0	1737	775	395	0	712			
Arrive On Green	0.15	0.68	0.00	0.00	0.49	0.49	0.22	0.00	0.22			
Sat Flow, veh/h	3408	3632	0	0	3668	1594	1774	0	3198			
Grp Volume(v), veh/h	421	972	0	0	1005	270	237	0	788			
Grp Sat Flow(s),veh/h/ln	1704	1770	0	0	1787	1594	1774	0	1599			
Q Serve(g_s), s	13.2	13.4	0.0	0.0	22.1	11.5	13.2	0.0	24.5			
Cycle Q Clear(g_c), s	13.2	13.4	0.0	0.0	22.1	11.5	13.2	0.0	24.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	512	2397	0	0	1737	775	395	0	712			
V/C Ratio(X)	0.82	0.41	0.00	0.00	0.58	0.35	0.60	0.00	1.11			
Avail Cap(c_a), veh/h	1100	2397	0	0	1737	775	395	0	712			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.67	0.67	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	45.3	7.9	0.0	0.0	20.2	17.5	38.4	0.0	42.8			
Incr Delay (d2), s/veh	2.3	0.3	0.0	0.0	1.4	1.2	6.6	0.0	66.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.4	6.6	0.0	0.0	11.2	5.3	7.2	0.0	17.4			
LnGrp Delay(d),s/veh	47.6	8.2	0.0	0.0	21.6	18.7	44.9	0.0	109.4			
LnGrp LOS	D	A			C	B	D		F			
Approach Vol, veh/h		1393			1275			1025				
Approach Delay, s/veh		20.1			21.0			94.5				
Approach LOS		C			C			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		80.0			21.0	59.0		30.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.5
Max Green Setting (Gmax), s		74.5			35.5	34.5		24.5
Max Q Clear Time (g_c+I1), s		15.4			15.2	24.1		26.5
Green Ext Time (p_c), s		12.4			1.4	6.4		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	41.1
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Intersection Level Of Service Report
#89: Pats Ranch Road / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	17.1
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.629

Intersection Setup

Name	Pats Ranch Road		Limonite Avenue		Limonite Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	210.00	100.00	100.00	100.00	170.00	100.00
Speed [mph]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	yes		no		no	

Volumes

Name	Pats Ranch Road		Limonite Avenue		Limonite Avenue	
Base Volume Input [veh/h]	302	151	1039	229	218	880
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	42	13	0	80	24	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	64	0	87	0	0
Total Hourly Volume [veh/h]	344	100	1039	222	242	880
Peak Hour Factor	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	92	27	278	59	65	235
Total Analysis Volume [veh/h]	368	107	1110	237	259	940
Presence of On-Street Parking	no	no	no	no	no	no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Protected	Permissive
Signal Group	3	0	2	0	1	6
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	6	0	6	0	5	6
Maximum Green [s]	0	0	0	0	0	0
Amber [s]	3.6	0.0	4.7	0.0	3.2	4.7
All red [s]	1.0	0.0	1.0	0.0	1.0	1.0
Split [s]	14	0	30	0	21	51
Vehicle Extension [s]	2.5	0.0	3.0	0.0	1.5	3.0
Walk [s]	0	0	11	0	0	0
Pedestrian Clearance [s]	0	0	13	0	0	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.6	0.0	3.7	0.0	2.2	3.7
Minimum Recall	no		no		no	no
Maximum Recall	no		yes		no	yes
Pedestrian Recall	no		no		no	no
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	R	C	R	L	C
L, Total Lost Time per Cycle [s]	4.60	4.60	5.70	5.70	4.20	5.70
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	3.70	3.70	2.20	3.70
g_i, Effective Green Time [s]	9	9	29	29	12	45
g / C, Green / Cycle	0.14	0.14	0.45	0.45	0.19	0.70
(v / s)_i Volume / Saturation Flow Rate	0.12	0.08	0.35	0.17	0.16	0.29
s, saturation flow rate [veh/h]	3101	1425	3192	1425	1597	3192
c, Capacity [veh/h]	447	205	1429	638	295	2226
d1, Uniform Delay [s]	26.98	25.70	15.18	11.88	25.73	4.22
k, delay calibration	0.08	0.08	0.50	0.50	0.09	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.91	1.52	4.21	1.66	6.94	0.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

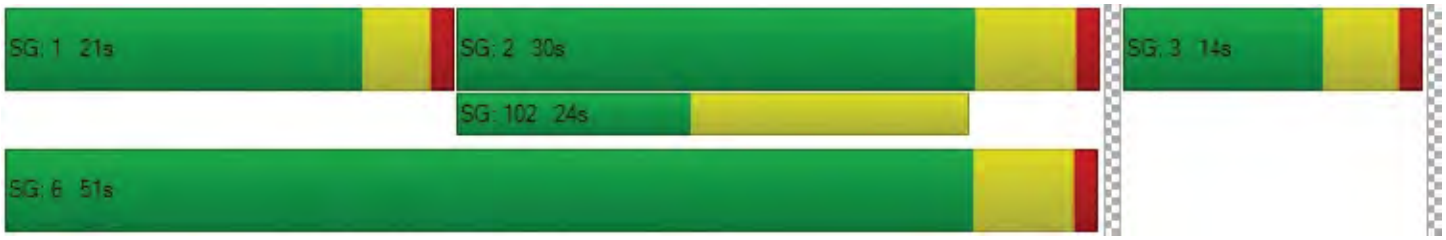
X, volume / capacity	0.82	0.52	0.78	0.37	0.88	0.42
d, Delay for Lane Group [s/veh]	29.89	27.22	19.40	13.54	32.67	4.81
Lane Group LOS	C	C	B	B	C	A
Critical Lane Group	yes	no	yes	no	yes	no
50th-Percentile Queue Length [veh]	2.75	1.51	6.31	2.12	4.01	1.45
50th-Percentile Queue Length [ft]	68.86	37.82	157.63	53.03	100.14	36.21
95th-Percentile Queue Length [veh]	4.96	2.72	10.42	3.82	7.21	2.61
95th-Percentile Queue Length [ft]	123.94	68.07	260.58	95.45	180.25	65.17

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	29.89	27.22	19.40	13.54	32.67	4.81
Movement LOS	C	C	B	B	C	A
d_A, Approach Delay [s/veh]	29.29		18.37		10.83	
Approach LOS	C		B		B	
d_I, Intersection Delay [s/veh]	17.09					
Intersection LOS	B					
Intersection V/C	0.629					

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
#90: Pats Ranch Road / 65th Street

Control Type:	Signalized	Delay (sec / veh):	13.2
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.241

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	90.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Base Volume Input [veh/h]	81	114	10	51	250	8	34	6	27	7	22	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	59	0	0	112	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	15	0	0	14
Total Hourly Volume [veh/h]	81	173	10	51	362	8	34	6	12	7	22	5
Peak Hour Factor	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	50	3	15	105	2	10	2	3	2	6	1
Total Analysis Volume [veh/h]	94	201	12	59	421	9	40	7	14	8	26	6
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	0	1	6	0	0	4	0	0	8	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.6	3.6	0.0	3.6	3.6	0.0	0.0	3.6	0.0	0.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	12	27	0	12	27	0	0	31	0	0	31	0
Vehicle Extension [s]	2.5	2.5	0.0	2.5	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	15	0	0	15	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.6	2.6	0.0	2.6	2.6	0.0	0.0	2.6	0.0	0.0	2.6	0.0
Minimum Recall	no	no		no	no			no			no	
Maximum Recall	no	yes		no	yes			no			no	
Pedestrian Recall	no	no		no	no			no			no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	6	48	48	5	47	47	4	4	4	4
g / C, Green / Cycle	0.08	0.68	0.68	0.07	0.67	0.67	0.05	0.05	0.05	0.05
(v / s)_i Volume / Saturation Flow Rate	0.06	0.06	0.06	0.04	0.13	0.01	0.03	0.01	0.05	0.00
s, saturation flow rate [veh/h]	1597	1676	1643	1597	3192	1425	1241	1500	675	1425
c, Capacity [veh/h]	133	1143	1120	108	2126	949	103	80	100	76
d1, Uniform Delay [s]	31.17	3.77	3.77	31.51	4.49	3.92	34.89	31.72	32.77	31.41
k, delay calibration	0.08	0.50	0.50	0.08	0.50	0.50	0.08	0.08	0.08	0.08
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.08	0.16	0.16	3.21	0.21	0.02	1.75	1.29	1.49	0.33
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

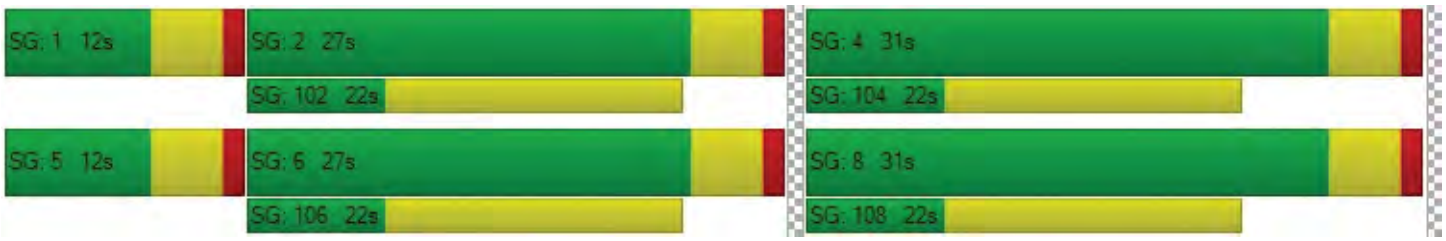
X, volume / capacity	0.71	0.09	0.09	0.55	0.20	0.01	0.39	0.26	0.34	0.08
d, Delay for Lane Group [s/veh]	36.25	3.92	3.93	34.73	4.69	3.94	36.64	33.01	34.26	31.74
Lane Group LOS	D	A	A	C	A	A	D	C	C	C
Critical Lane Group	yes	no	no	no	yes	no	no	no	yes	no
50th-Percentile Queue Length [veh]	1.65	0.39	0.39	1.01	0.88	0.04	0.74	0.36	0.61	0.10
50th-Percentile Queue Length [ft]	41.34	9.74	9.67	25.36	22.05	0.89	18.56	9.08	15.20	2.54
95th-Percentile Queue Length [veh]	2.98	0.70	0.70	1.83	1.59	0.06	1.34	0.65	1.09	0.18
95th-Percentile Queue Length [ft]	74.42	17.54	17.40	45.64	39.69	1.59	33.40	16.35	27.35	4.57

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	36.25	3.93	3.93	34.73	4.69	3.94	36.64	33.01	33.01	34.26	34.26	31.74
Movement LOS	D	A	A	C	A	A	D	C	C	C	C	C
d_A, Approach Delay [s/veh]	14.05			8.30			35.39			33.88		
Approach LOS	B			A			D			C		
d_I, Intersection Delay [s/veh]	13.25											
Intersection LOS	B											
Intersection V/C	0.241											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



The delay reported in the traffic study is higher than that calculated in this worksheet as the calculated delay is lower than the comparable previous scenario. This is due to the HCM 2010 methodology which reports delay as the average delay of all vehicles at the intersection. The lower delay in this scenario is due to the fact that the added volumes are to movements experiencing lower delays than most.

Intersection Level Of Service Report
#91: Pats Ranch Road / Driveway 1

Control Type:	Two-way stop	Delay (sec / veh):	9.6
Analysis Method:	HCM2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.014

Intersection Setup

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	150.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		yes	

Volumes

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Base Volume Input [veh/h]	0	205	284	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	59	56	56	0	10
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	264	340	56	0	10
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	72	92	15	0	3
Total Analysis Volume [veh/h]	0	287	370	61	0	11
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	9.63
Movement LOS		A	A	A		A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.04
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	1.06
d_A, Approach Delay [s/veh]	0.00		0.00		9.63	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.15					
Intersection LOS	A					

Intersection Level Of Service Report
#92: Pats Ranch Road / Ivory Street

Control Type:	Two-way stop	Delay (sec / veh):	14.7
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 2			Ivory Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	150.00	100.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 2			Ivory Street		
Base Volume Input [veh/h]	0	189	16	27	257	0	0	0	0	6	0	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	48	0	0	0	10	56	59	0	16	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	48	189	16	27	267	56	59	0	16	6	0	16
Peak Hour Factor	0.8290	0.8290	0.8290	0.8290	0.8290	0.8290	0.8290	0.8290	0.8290	0.8290	0.8290	0.8290
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	57	5	8	81	17	18	0	5	2	0	5
Total Analysis Volume [veh/h]	58	228	19	33	322	68	71	0	19	7	0	19
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			no	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			yes	yes
Number of Storage Spaces in Median	0	0	2	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.00	0.00	0.03	0.00	0.00	0.15	0.00	0.02	0.01	0.00	0.02
d_M, Delay for Movement [s/veh]	8.25	0.00	0.00	7.81	0.00	0.00	14.13	14.67	10.89	12.29	13.84	9.07
Movement LOS	A	A	A	A	A	A	B	B	B	B	B	A
95th-Percentile Queue Length [veh]	0.16	0.00	0.00	0.08	0.00	0.00	0.63	0.63	0.63	0.04	0.04	0.06
95th-Percentile Queue Length [ft]	3.92	0.00	0.00	1.93	0.00	0.00	15.66	15.66	15.66	1.06	1.06	1.61
d_A, Approach Delay [s/veh]	1.57			0.61			13.45			9.93		
Approach LOS	A			A			B			A		
d_I, Intersection Delay [s/veh]	2.61											
Intersection LOS	B											

Intersection Level Of Service Report
#93: Pats Ranch Road / 68th Street

Control Type:	All-way stop	Delay (sec / veh):	14.8
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	Pats Ranch Road		68th Street		68th Street	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1
Pocket Length [ft]	100.00	100.00	200.00	100.00	100.00	220.00
Speed [mph]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	yes		no		no	

Volumes

Name	Pats Ranch Road		68th Street		68th Street	
Base Volume Input [veh/h]	30	233	189	232	209	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	4	22	40	0	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	255	229	232	209	24
Peak Hour Factor	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	75	68	68	62	7
Total Analysis Volume [veh/h]	40	301	270	274	246	28
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.27	2.99	3.03	2.73	0.94	0.94	0.16
95th-Percentile Queue Length [ft]	6.68	74.71	75.70	68.23	23.51	23.51	3.90
Approach Delay [s/veh]	14.89		16.32		11.77		
Approach LOS	B		C		B		
Intersection Delay [s/veh]	14.82						
Intersection LOS	B						

Intersection Level Of Service Report
#94: Wineville Avenue / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	26.3
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.544

Intersection Setup

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Pocket Length [ft]	185.00	100.00	100.00	100.00	100.00	100.00	250.00	100.00	360.00	245.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Base Volume Input [veh/h]	51	46	33	127	90	194	169	956	65	52	853	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	13	0	0	24	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	32	0	0	0
Total Hourly Volume [veh/h]	51	46	33	127	90	194	169	969	33	52	877	74
Peak Hour Factor	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	12	9	34	24	53	46	262	9	14	238	20
Total Analysis Volume [veh/h]	55	50	36	138	98	210	183	1050	36	56	950	80
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	26.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	5	0	4	5	0	4	6	0	4	6	0
Maximum Green [s]	37	58	0	37	58	0	20	0	0	75	0	0
Amber [s]	3.0	4.3	0.0	3.0	4.3	0.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0
Split [s]	9	32	0	14	37	0	16	36	0	8	28	0
Vehicle Extension [s]	1.5	2.0	0.0	1.5	2.0	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Walk [s]	0	5	0	0	5	0	0	10	0	0	10	0
Pedestrian Clearance [s]	0	21	0	0	16	0	0	13	0	0	12	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	1.5	3.3	0.0	1.5	3.3	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	no		no	no		no	yes		no	yes	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	L	C	R	L	C	C
L, Total Lost Time per Cycle [s]	3.50	5.30	5.30	3.50	5.30	3.50	6.00	6.00	3.50	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.50	3.30	3.30	1.50	3.30	1.50	4.00	4.00	1.50	4.00	4.00
g_i, Effective Green Time [s]	4	14	14	9	19	11	46	46	4	39	39
g / C, Green / Cycle	0.04	0.15	0.15	0.10	0.21	0.12	0.51	0.51	0.04	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.03	0.03	0.02	0.08	0.19	0.10	0.30	0.02	0.03	0.20	0.20
s, saturation flow rate [veh/h]	1774	1863	1597	1774	1663	1774	3547	1583	1774	1863	1792
c, Capacity [veh/h]	71	281	241	171	344	218	1804	805	73	796	766
d1, Uniform Delay [s]	42.83	33.34	33.28	39.90	34.79	38.66	15.45	11.13	42.76	18.47	18.47
k, delay calibration	0.04	0.04	0.04	0.12	0.04	0.19	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.42	0.11	0.11	9.44	3.37	13.95	1.38	0.10	6.07	1.97	2.05
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.77	0.17	0.16	0.81	0.90	0.84	0.58	0.04	0.77	0.47	0.47
d, Delay for Lane Group [s/veh]	49.25	33.45	33.39	49.34	38.16	52.61	16.83	11.23	48.83	20.45	20.53
Lane Group LOS	D	C	C	D	D	D	B	B	D	C	C
Critical Lane Group	yes	no	no	no	yes	no	yes	no	yes	no	no
50th-Percentile Queue Length [veh]	1.29	0.88	0.70	3.30	6.48	4.59	6.83	0.34	1.28	5.23	5.05
50th-Percentile Queue Length [ft]	32.20	21.94	17.45	82.45	161.95	114.87	170.84	8.60	31.96	130.63	126.17
95th-Percentile Queue Length [veh]	2.32	1.58	1.26	5.94	10.65	8.11	11.12	0.62	2.30	8.97	8.73
95th-Percentile Queue Length [ft]	57.95	39.49	31.40	148.41	266.31	202.76	278.02	15.47	57.52	224.35	218.28

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	49.25	33.45	33.39	49.34	38.16	38.16	52.61	16.83	11.23	48.83	20.48	20.53
Movement LOS	D	C	C	D	D	D	D	B	B	D	C	C
d_A, Approach Delay [s/veh]	39.60			41.62			21.83			22.50		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	26.32											
Intersection LOS	C											
Intersection V/C	0.544											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

The delay reported in the traffic study is higher than that calculated in this worksheet as the calculated delay is lower than the comparable previous scenario. This is due to the HCM 2010 methodology which reports delay as the average delay of all vehicles at the intersection. The lower delay in this scenario is due to the fact that the added volumes are to movements experiencing lower delays than most.

APPENDIX 5.2:

EXISTING PLUS PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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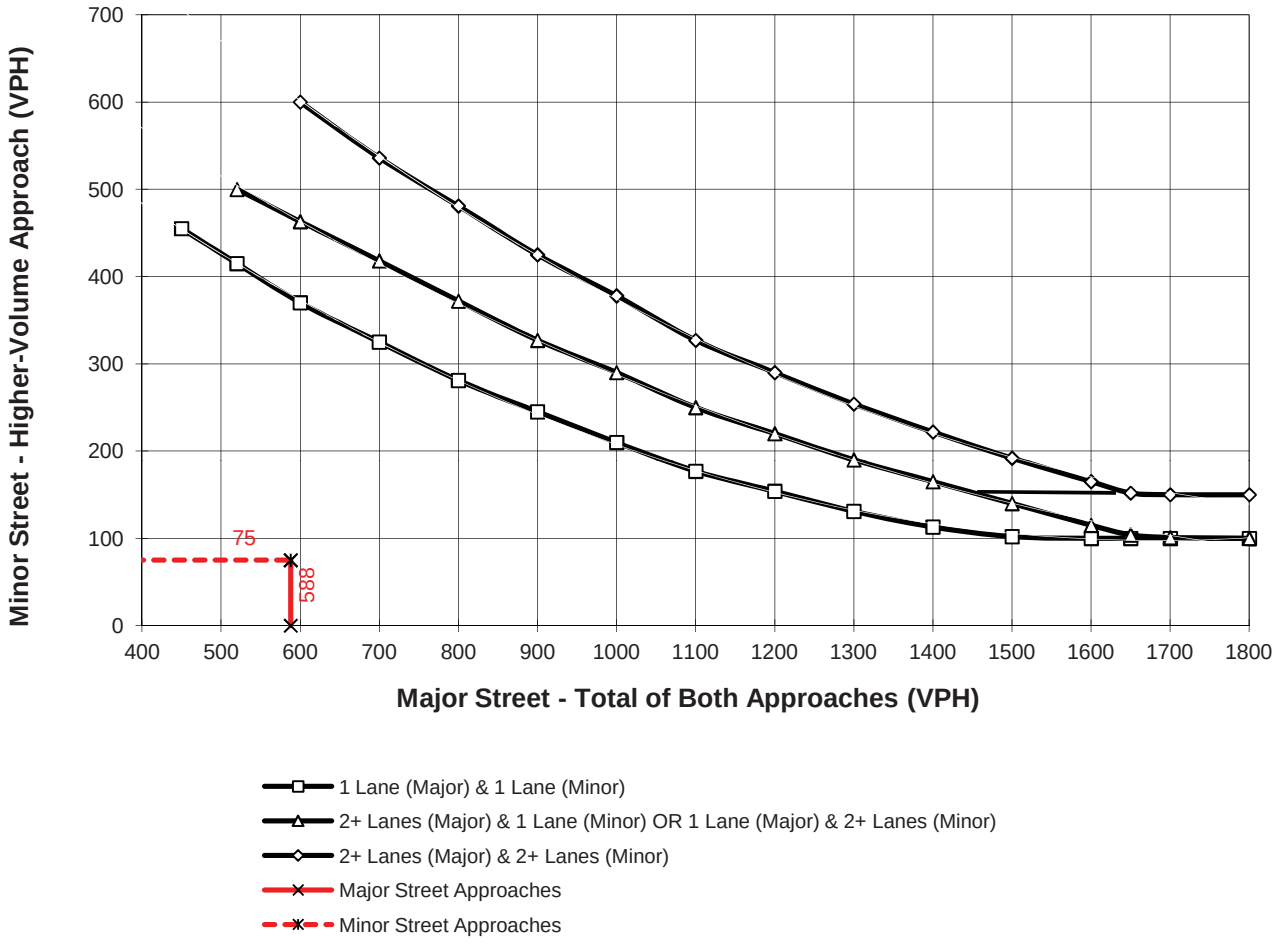
Figure 4C-3. Warrant 3, Peak Hour

Traffic Conditions = **E+P (Phase 1) Conditions - Weekday AM Peak Hour**

Major Street Name = **Pats Ranch Road**
Total of Both Approaches (VPH) = **588**
Number of Approach Lanes on Major Street = **2**

Minor Street Name = **Driveway 1**
High Volume Approach (VPH) = **75**
Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 150 vph applies as the lower threshold for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold for a minor-street approach with one lane

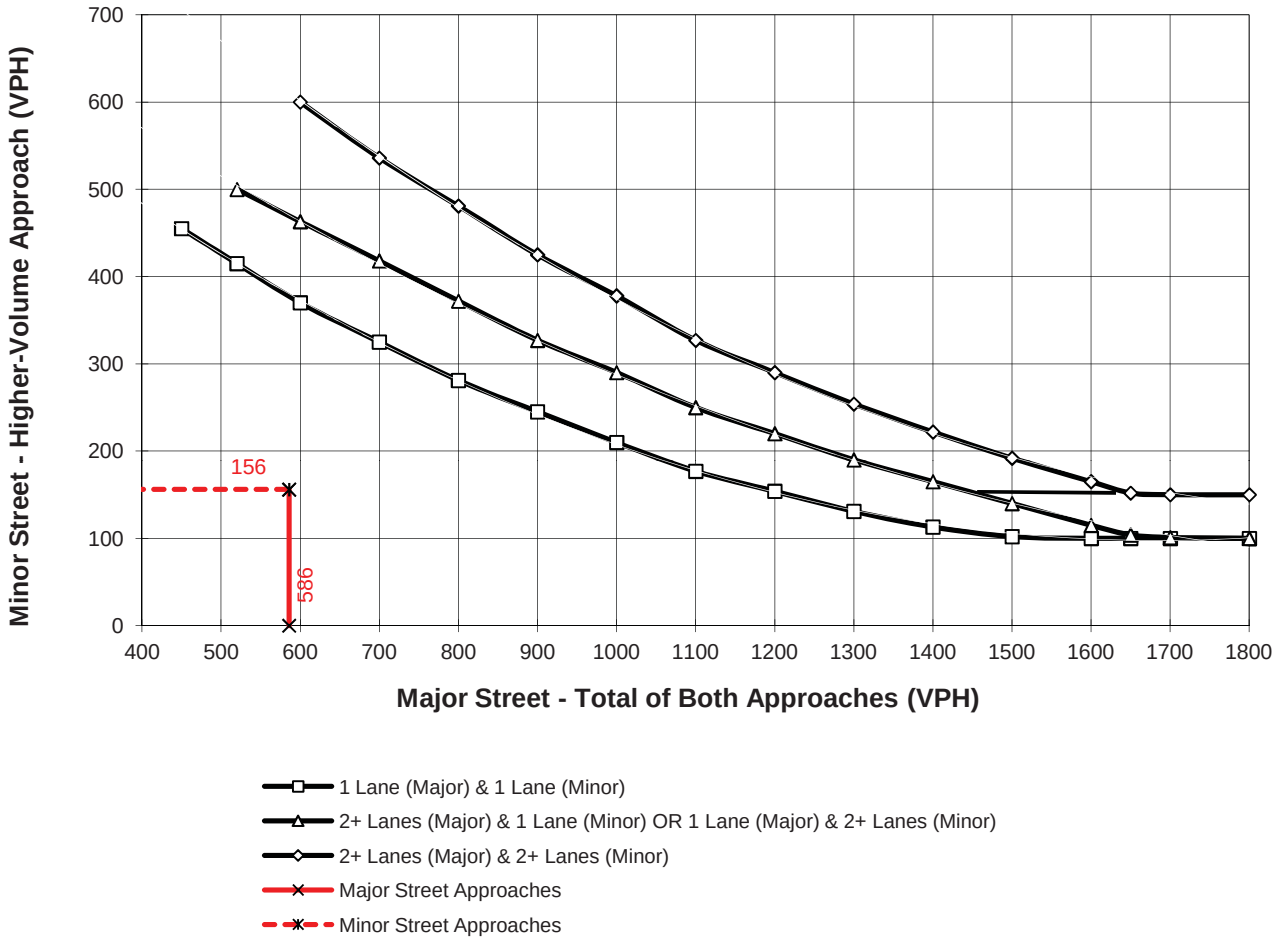
Figure 4C-3. Warrant 3, Peak Hour

Traffic Conditions = **E+P (Phase 1) Conditions - Weekday Mid-day Peak Hour**

Major Street Name = **Pats Ranch Road**
Total of Both Approaches (VPH) = **586**
Number of Approach Lanes on Major Street = **2**

Minor Street Name = **Ivory Street**
High Volume Approach (VPH) = **156**
Number of Approach Lanes On Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 150 vph applies as the lower threshold for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold for a minor-street approach with one lane

APPENDIX 5.3:

EXISTING PLUS PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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Intersection: 33: I-15 SB Ramps & Limonite Av.

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	684	574	256	272	271	93	99	158	240	218
Average Queue (ft)	329	212	114	172	178	9	7	70	149	95
95th Queue (ft)	549	437	217	243	258	50	47	134	229	200
Link Distance (ft)	1184	1184				705	705		1101	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)			150	275	275			400		400
Storage Blk Time (%)		3	4	0	0					
Queuing Penalty (veh)		12	18	0	1					

Intersection: 34: I-15 NB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	329	336	126	159	639	550	268	193	234	201
Average Queue (ft)	149	158	41	64	392	311	113	85	135	77
95th Queue (ft)	270	286	108	141	584	508	237	161	223	181
Link Distance (ft)			705	705	1130	1130			1258	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300	300					150	450		450
Storage Blk Time (%)	0	1				15	2			
Queuing Penalty (veh)	0	1				53	11			

Network Summary

Network wide Queuing Penalty: 97

Intersection: 33: I-15 SB Ramps & Limonite Av.

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	390	338	249	212	214	160	162	243	319	283
Average Queue (ft)	252	194	102	117	122	54	48	124	215	167
95th Queue (ft)	361	305	188	189	195	131	127	213	291	262
Link Distance (ft)	1184	1184				705	705		1101	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)			150	275	275			400		400
Storage Blk Time (%)		7	2							
Queuing Penalty (veh)		31	12							

Intersection: 34: I-15 NB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	222	242	250	252	390	318	123	296	344	321
Average Queue (ft)	105	120	115	135	236	167	47	165	237	195
95th Queue (ft)	180	195	217	233	342	290	94	253	317	286
Link Distance (ft)			705	705	1130	1130			1258	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300	300					150	450		450
Storage Blk Time (%)	0	0	0			5	0			
Queuing Penalty (veh)	0	0	0			12	1			

Network Summary

Network wide Queuing Penalty: 56

APPENDIX 5.4:

EXISTING PLUS PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Option 1: AM Improvements

Number	93					
Intersection	Pats Ranch Road / 68th Street					
Control Type	Signalized					
Analysis Method	HCM 2010					
Name	Pats Ranch Road		68th Street		68th Street	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Base Volume Input [veh/h]	25	193	250	407	379	35
Total Analysis Volume [veh/h]	34	261	338	551	513	47

Intersection Settings

Cycle Length [s]	95					
Coordination Type	Time of Day Pattern Coordinated					
Actuation Type	Fixed time					
Lost time [s]	0.00					
Control Type	Permissive	Overlap	Protected	Permissive	Permissive	Permissive
Signal Group	5	3	3	8	4	0
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	10	10	10	10	10	0
Maximum Green [s]	0	0	0	0	0	0
Amber [s]	5.0	3.0	3.0	5.0	5.0	0.0
All red [s]	2.0	1.0	1.0	2.0	2.0	0.0
Split [s]	27	34	34	68	34	0
Walk [s]	7	0	0	7	7	0
Pedestrian Clearance [s]	20	0	0	20	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	no	no	no	no	no	
Maximum Recall	no	no	no	yes	yes	
Pedestrian Recall	no	no	no	no	no	

Lane Group Calculations

g / C, Green / Cycle	0.21	0.60	0.32	0.64	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.02	0.18	0.21	0.33	0.16	0.03
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900
Arrival type	3		3		3	
s, saturation flow rate [veh/h]	1597	1425	1597	1676	3192	1425
c, Capacity [veh/h]	336	855	504	1076	907	405
X, volume / capacity	0.10	0.31	0.67	0.51	0.57	0.12
d, Delay for Lane Group [s/veh]	30.85	10.23	35.14	10.80	31.55	25.75
Lane Group LOS	C	B	D	B	C	C
Critical Lane Group	no	yes	yes	no	yes	no
50th-Percentile Queue Length [veh]	0.67	2.60	7.18	5.35	5.00	0.81
50th-Percentile Queue Length [ft]	16.80	64.95	179.61	133.64	125.11	20.26
95th-Percentile Queue Length [veh]	1.21	4.68	11.58	9.14	8.67	1.46
95th-Percentile Queue Length [ft]	30.23	116.90	289.51	228.44	216.83	36.46

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	30.85	10.23	35.14	10.80	31.55	25.75
Movement LOS	C	B	D	B	C	C
Critical Movement	no	no	yes	no	no	no
d_A, Approach Delay [s/veh]	12.60		20.06		31.06	
Approach LOS	B		C		C	
d_I, Intersection Delay [s/veh]	22.33					
Intersection LOS	C					
Intersection V/C	0.556					

Option 1: Mid-Day Improvements

Number	93					
Intersection	Pats Ranch Road / 68th Street					
Control Type	Signalized					
Analysis Method	HCM 2010					
Name	Pats Ranch Road		68th Street		68th Street	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Base Volume Input [veh/h]	28	231	187	253	307	41
Total Analysis Volume [veh/h]	41	341	276	373	453	60

Intersection Settings

Cycle Length [s]	90					
Coordination Type	Time of Day Pattern Coordinated					
Actuation Type	Fixed time					
Lost time [s]	0.00					
Control Type	Permissive	Overlap	Protected	Permissive	Permissive	Permissive
Signal Group	5	3	3	8	4	0
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	10	10	10	10	10	0
Maximum Green [s]	0	0	0	0	0	0
Amber [s]	5.0	3.0	3.0	5.0	5.0	0.0
All red [s]	2.0	1.0	1.0	2.0	2.0	0.0
Split [s]	27	29	29	63	34	0
Walk [s]	7	0	0	7	7	0
Pedestrian Clearance [s]	20	0	0	20	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	no	no	no	no	no	
Maximum Recall	no	no	no	yes	yes	
Pedestrian Recall	no	no	no	no	no	

Lane Group Calculations

g / C, Green / Cycle	0.22	0.58	0.28	0.62	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.03	0.24	0.17	0.22	0.14	0.04
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900
Arrival type	3		3		3	
s, saturation flow rate [veh/h]	1597	1425	1597	1676	3192	1425
c, Capacity [veh/h]	355	823	444	1043	958	428
X, volume / capacity	0.12	0.41	0.62	0.36	0.47	0.14
d, Delay for Lane Group [s/veh]	28.60	12.08	34.82	9.22	27.37	23.71
Lane Group LOS	C	B	C	A	C	C
Critical Lane Group	no	yes	no	no	yes	no
50th-Percentile Queue Length [veh]	0.75	3.69	5.63	3.10	3.90	0.95
50th-Percentile Queue Length [ft]	18.81	92.22	140.72	77.45	97.53	23.86
95th-Percentile Queue Length [veh]	1.35	6.64	9.52	5.58	7.02	1.72
95th-Percentile Queue Length [ft]	33.86	165.99	238.00	139.41	175.55	42.95

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	28.60	12.08	34.82	9.22	27.37	23.71
Movement LOS	C	B	C	A	C	C
Critical Movement	no	no	yes	no	no	no
d_A, Approach Delay [s/veh]	13.86		20.11		26.94	
Approach LOS	B		C		C	
d_I, Intersection Delay [s/veh]	20.83					
Intersection LOS	C					
Intersection V/C	0.381					

Option 1: PM Improvements

Number	93					
Intersection	Pats Ranch Road / 68th Street					
Control Type	Signalized					
Analysis Method	HCM 2010					
Name	Pats Ranch Road		68th Street		68th Street	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Base Volume Input [veh/h]	30	233	189	232	209	16
Total Analysis Volume [veh/h]	40	301	270	274	246	28

Intersection Settings

Cycle Length [s]	95					
Coordination Type	Time of Day Pattern Coordinated					
Actuation Type	Fixed time					
Lost time [s]	0.00					
Control Type	Permissive	Overlap	Protected	Permissive	Permissive	Permissive
Signal Group	5	3	3	8	4	0
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	10	10	10	10	10	0
Maximum Green [s]	0	0	0	0	0	0
Amber [s]	5.0	5.0	5.0	5.0	5.0	0.0
All red [s]	2.0	2.0	2.0	2.0	2.0	0.0
Split [s]	27	34	34	68	34	0
Walk [s]	7	0	0	7	7	0
Pedestrian Clearance [s]	20	0	0	20	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	no	no	no	no	no	
Maximum Recall	no	no	no	yes	yes	
Pedestrian Recall	no	no	no	no	no	

Lane Group Calculations

g / C, Green / Cycle	0.21	0.57	0.28	0.64	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.03	0.21	0.17	0.16	0.08	0.02
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900
Arrival type	3		3		3	
s, saturation flow rate [veh/h]	1597	1425	1597	1676	3192	1425
c, Capacity [veh/h]	336	810	454	1076	907	405
X, volume / capacity	0.12	0.37	0.60	0.25	0.27	0.07
d, Delay for Lane Group [s/veh]	31.09	12.52	34.94	7.84	27.11	25.15
Lane Group LOS	C	B	C	A	C	C
Critical Lane Group	no	yes	no	no	yes	no
50th-Percentile Queue Length [veh]	0.79	3.45	5.69	2.10	2.14	0.47
50th-Percentile Queue Length [ft]	19.86	86.33	142.30	52.40	53.38	11.87
95th-Percentile Queue Length [veh]	1.43	6.22	9.60	3.77	3.84	0.85
95th-Percentile Queue Length [ft]	35.75	155.40	240.12	94.32	96.08	21.36

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	31.09	12.52	34.94	7.84	27.11	25.15
Movement LOS	C	B	C	A	C	C
Critical Movement	no	no	yes	no	no	no
d_A, Approach Delay [s/veh]	14.70		21.29		26.91	
Approach LOS	B		C		C	
d_I, Intersection Delay [s/veh]	20.68					
Intersection LOS	C					
Intersection V/C	0.288					

APPENDIX 6.1:

EAP (2016) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Intersection Level Of Service Report
#86: Hamner Avenue / 68th Street

Control Type:	Signalized	Delay (sec / veh):	39.9
Analysis Method:	HCM2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.538

Intersection Setup

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	280.00	100.00	100.00	250.00	100.00	100.00	200.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Base Volume Input [veh/h]	45	646	151	51	497	38	108	175	76	223	170	78
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	4	4	0	0	0	2	0	16	8	16
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	62	0	0	18	0	0	18	0	0	32
Total Hourly Volume [veh/h]	47	672	99	57	517	22	112	184	61	248	185	65
Peak Hour Factor	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	191	28	16	147	6	32	52	17	71	53	18
Total Analysis Volume [veh/h]	53	765	113	65	588	25	127	209	69	282	210	74
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0
All red [s]	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Split [s]	12	34	0	12	34	0	23	34	0	25	36	0
Vehicle Extension [s]	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	L	C	R
L, Total Lost Time per Cycle [s]	5.00	7.00	7.00	5.00	7.00	7.00	5.00	7.00	5.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	5.00	5.00	3.00	5.00	5.00	3.00	5.00	3.00	5.00	5.00
g_i, Effective Green Time [s]	6	35	35	6	35	35	10	21	20	31	31
g / C, Green / Cycle	0.05	0.33	0.33	0.06	0.33	0.33	0.10	0.20	0.19	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.03	0.15	0.15	0.04	0.10	0.11	0.08	0.17	0.18	0.13	0.05
s, saturation flow rate [veh/h]	1597	3192	1542	1597	3192	1635	1597	1606	1597	1676	1425
c, Capacity [veh/h]	84	1050	507	90	1064	545	152	315	302	487	414
d1, Uniform Delay [s]	48.75	27.69	27.74	48.70	26.07	26.10	46.70	41.01	41.89	30.20	27.86
k, delay calibration	0.04	0.50	0.50	0.04	0.50	0.50	0.04	0.27	0.32	0.23	0.23
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.92	1.37	2.87	3.95	0.78	1.53	4.57	17.11	27.67	1.29	0.44
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

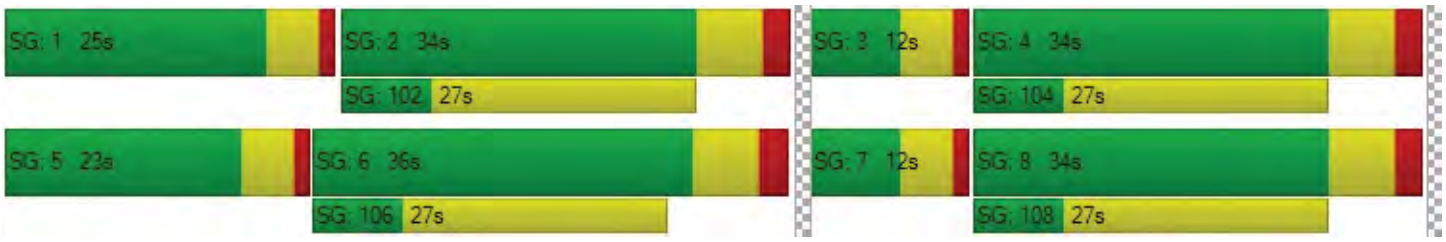
X, volume / capacity	0.63	0.45	0.45	0.72	0.32	0.32	0.84	0.88	0.93	0.43	0.18
d, Delay for Lane Group [s/veh]	51.67	29.05	30.61	52.65	26.85	27.62	51.28	58.12	69.55	31.48	28.30
Lane Group LOS	D	C	C	D	C	C	D	E	E	C	C
Critical Lane Group	no	no	yes	yes	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	1.39	4.59	4.69	1.72	3.09	3.30	3.34	8.18	9.19	4.28	1.39
50th-Percentile Queue Length [ft]	34.68	114.63	117.35	43.05	77.26	82.60	83.56	204.54	229.87	107.06	34.65
95th-Percentile Queue Length [veh]	2.50	8.10	8.25	3.10	5.56	5.95	6.02	12.87	14.17	7.68	2.49
95th-Percentile Queue Length [ft]	62.43	202.43	206.18	77.49	139.07	148.67	150.40	321.81	354.19	191.91	62.37

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.67	29.36	30.61	52.65	27.09	27.62	51.28	58.12	58.12	69.55	31.48	28.30
Movement LOS	D	C	C	D	C	C	D	E	E	E	C	C
d_A, Approach Delay [s/veh]	31.13			30.01			55.97			50.04		
Approach LOS	C			C			E			D		
d_I, Intersection Delay [s/veh]	39.90											
Intersection LOS	D											
Intersection V/C	0.538											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1003	440	633	607	0	0	0	0	131	0	445
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0.0	182.7	182.7	184.5	175.9	0.0				179.2	182.5	182.7
Adj Flow Rate, veh/h	0	1034	454	653	626	0				90	0	507
Adj No. of Lanes	0	2	1	2	2	0				1	0	2
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	4	4	3	8	0				6	0	4
Cap, veh/h	0	1589	711	737	2392	0				312	0	563
Arrive On Green	0.00	0.46	0.46	0.14	0.48	0.00				0.18	0.00	0.18
Sat Flow, veh/h	0	3563	1553	3408	3431	0				1707	0	3080
Grp Volume(v), veh/h	0	1034	454	653	626	0				90	0	507
Grp Sat Flow(s),veh/h/ln	0	1736	1553	1704	1671	0				1707	0	1540
Q Serve(g_s), s	0.0	24.9	24.3	20.4	12.1	0.0				4.9	0.0	17.4
Cycle Q Clear(g_c), s	0.0	24.9	24.3	20.4	12.1	0.0				4.9	0.0	17.4
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1589	711	737	2392	0				312	0	563
V/C Ratio(X)	0.00	0.65	0.64	0.89	0.26	0.00				0.29	0.00	0.90
Avail Cap(c_a), veh/h	0	1589	711	1117	2392	0				339	0	612
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.45	0.45	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	22.7	22.5	45.0	11.2	0.0				38.2	0.0	43.3
Incr Delay (d2), s/veh	0.0	0.8	1.5	1.9	0.1	0.0				0.2	0.0	14.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.1	10.6	9.8	5.6	0.0				2.3	0.0	8.6
LnGrp Delay(d),s/veh	0.0	23.4	24.0	46.9	11.3	0.0				38.4	0.0	58.1
LnGrp LOS		C	C	D	B					D		E
Approach Vol, veh/h		1488			1279						597	
Approach Delay, s/veh		23.6			29.5						55.2	
Approach LOS		C			C						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	27.9	55.1		25.3		83.0		
Change Period (Y+Rc), s	4.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	35.5	37.5		21.5		77.5		
Max Q Clear Time (g_c+I1), s	22.4	26.9		19.4		14.1		
Green Ext Time (p_c), s	1.1	5.8		0.4		10.2		

Intersection Summary	
HCM 2010 Ctrl Delay	31.4
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	693	442	0	0	1027	367	213	2	291	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	182.7	179.2	0.0	0.0	181.0	182.7	174.3	179.5	181.0			
Adj Flow Rate, veh/h	745	475	0	0	1104	395	340	0	195			
Adj No. of Lanes	2	2	0	0	2	1	2	0	1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	4	6	0	0	5	4	9	0	5			
Cap, veh/h	843	2307	0	0	1329	598	740	0	343			
Arrive On Green	0.25	0.68	0.00	0.00	0.39	0.39	0.22	0.00	0.22			
Sat Flow, veh/h	3375	3495	0	0	3529	1547	3320	0	1538			
Grp Volume(v), veh/h	745	475	0	0	1104	395	340	0	195			
Grp Sat Flow(s),veh/h/ln	1688	1703	0	0	1719	1547	1660	0	1538			
Q Serve(g_s), s	23.4	5.8	0.0	0.0	31.9	23.1	9.8	0.0	12.4			
Cycle Q Clear(g_c), s	23.4	5.8	0.0	0.0	31.9	23.1	9.8	0.0	12.4			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	843	2307	0	0	1329	598	740	0	343			
V/C Ratio(X)	0.88	0.21	0.00	0.00	0.83	0.66	0.46	0.00	0.57			
Avail Cap(c_a), veh/h	1089	2307	0	0	1329	598	740	0	343			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.78	0.78	0.00	0.00	0.88	0.88	1.00	0.00	1.00			
Uniform Delay (d), s/veh	39.7	6.7	0.0	0.0	30.5	27.8	37.0	0.0	38.1			
Incr Delay (d2), s/veh	5.7	0.2	0.0	0.0	5.4	5.0	2.1	0.0	6.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	11.5	2.8	0.0	0.0	16.0	10.7	4.7	0.0	5.9			
LnGrp Delay(d),s/veh	45.5	6.8	0.0	0.0	35.9	32.8	39.1	0.0	44.8			
LnGrp LOS	D	A			D	C	D		D			
Approach Vol, veh/h		1220			1499			535				
Approach Delay, s/veh		30.4			35.1			41.1				
Approach LOS		C			D			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		80.0			32.0	48.0		30.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.5
Max Green Setting (Gmax), s		74.5			35.5	34.5		24.5
Max Q Clear Time (g_c+I1), s		7.8			25.4	33.9		14.4
Green Ext Time (p_c), s		9.4			2.1	0.5		1.4

Intersection Summary	
HCM 2010 Ctrl Delay	34.3
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Intersection Level Of Service Report
#89: Pats Ranch Road / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	12.1
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.478

Intersection Setup

Name	Pats Ranch Road		Limonite Avenue		Limonite Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	210.00	100.00	100.00	100.00	170.00	100.00
Speed [mph]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	yes		no		no	

Volumes

Name	Pats Ranch Road		Limonite Avenue		Limonite Avenue	
Base Volume Input [veh/h]	328	49	600	90	55	933
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	82	24	0	20	6	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	35	0	42	0	0
Total Hourly Volume [veh/h]	423	40	624	72	63	970
Peak Hour Factor	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	115	11	169	20	17	263
Total Analysis Volume [veh/h]	459	43	678	78	68	1053
Presence of On-Street Parking	no	no	no	no	no	no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Protected	Permissive
Signal Group	3	0	2	0	1	6
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	6	0	6	0	5	6
Maximum Green [s]	0	0	0	0	0	0
Amber [s]	3.6	0.0	4.7	0.0	3.2	4.7
All red [s]	1.0	0.0	1.0	0.0	1.0	1.0
Split [s]	15	0	30	0	15	45
Vehicle Extension [s]	2.5	0.0	3.0	0.0	1.5	3.0
Walk [s]	0	0	11	0	0	0
Pedestrian Clearance [s]	0	0	13	0	0	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.6	0.0	3.7	0.0	2.2	3.7
Minimum Recall	no		no		no	no
Maximum Recall	no		yes		no	yes
Pedestrian Recall	no		no		no	no
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	R	C	R	L	C
L, Total Lost Time per Cycle [s]	4.60	4.60	5.70	5.70	4.20	5.70
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	3.70	3.70	2.20	3.70
g_i, Effective Green Time [s]	10	10	32	32	3	39
g / C, Green / Cycle	0.17	0.17	0.53	0.53	0.06	0.66
(v / s)_i Volume / Saturation Flow Rate	0.15	0.03	0.21	0.05	0.04	0.33
s, saturation flow rate [veh/h]	3101	1425	3192	1425	1597	3192
c, Capacity [veh/h]	533	245	1691	755	89	2094
d1, Uniform Delay [s]	24.07	21.15	8.39	6.99	27.85	5.29
k, delay calibration	0.08	0.08	0.50	0.50	0.04	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.19	0.25	0.71	0.27	4.99	0.87
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

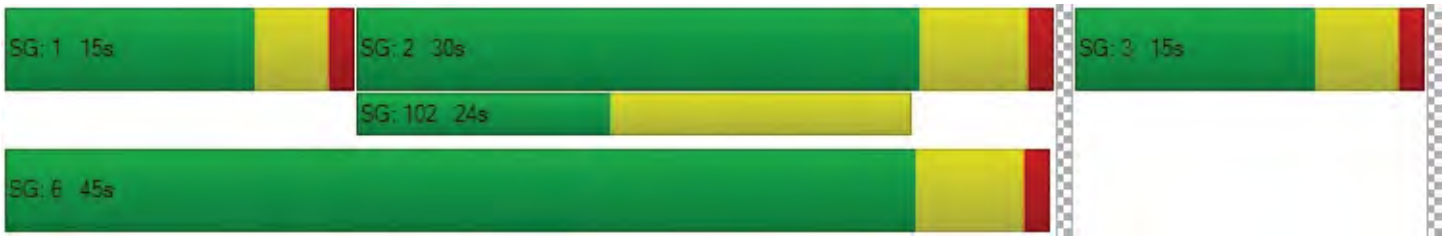
X, volume / capacity	0.86	0.18	0.40	0.10	0.76	0.50
d, Delay for Lane Group [s/veh]	27.26	21.40	9.10	7.27	32.84	6.15
Lane Group LOS	C	C	A	A	C	A
Critical Lane Group	yes	no	no	no	no	yes
50th-Percentile Queue Length [veh]	3.11	0.49	2.00	0.41	0.99	1.96
50th-Percentile Queue Length [ft]	77.67	12.24	50.11	10.25	24.65	48.91
95th-Percentile Queue Length [veh]	5.59	0.88	3.61	0.74	1.77	3.52
95th-Percentile Queue Length [ft]	139.81	22.03	90.20	18.44	44.37	88.04

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	27.26	21.40	9.10	7.27	32.84	6.15
Movement LOS	C	C	A	A	C	A
d_A, Approach Delay [s/veh]	26.76		8.91		7.77	
Approach LOS	C		A		A	
d_I, Intersection Delay [s/veh]	12.14					
Intersection LOS	B					
Intersection V/C	0.478					

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
#90: Pats Ranch Road / 65th Street

Control Type:	Signalized	Delay (sec / veh):	11.1
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.191

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	90.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Base Volume Input [veh/h]	44	246	30	7	119	0	19	5	19	41	6	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	114	0	0	28	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	3	0	0	0	0	0	16	0	0	24
Total Hourly Volume [veh/h]	46	370	28	7	152	0	20	5	4	43	6	10
Peak Hour Factor	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	112	8	2	46	0	6	2	1	13	2	3
Total Analysis Volume [veh/h]	56	449	34	8	184	0	24	6	5	52	7	12
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	0	1	6	0	0	4	0	0	8	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.6	3.6	0.0	3.6	3.6	0.0	0.0	3.6	0.0	0.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	16	27	0	16	27	0	0	27	0	0	27	0
Vehicle Extension [s]	2.5	2.5	0.0	2.5	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	15	0	0	15	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.6	2.6	0.0	2.6	2.6	0.0	0.0	2.6	0.0	0.0	2.6	0.0
Minimum Recall	no	no		no	no			no			no	
Maximum Recall	no	yes		no	yes			no			no	
Pedestrian Recall	no	no		no	no			no			no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	5	50	50	1	46	46	6	6	6	6
g / C, Green / Cycle	0.07	0.71	0.71	0.01	0.66	0.66	0.08	0.08	0.08	0.08
(v / s)_i Volume / Saturation Flow Rate	0.04	0.11	0.11	0.01	0.06	0.00	0.02	0.01	0.08	0.01
s, saturation flow rate [veh/h]	1597	1676	1622	1597	3192	1425	1263	1552	776	1425
c, Capacity [veh/h]	105	1188	1149	23	2096	936	103	124	159	114
d1, Uniform Delay [s]	31.61	3.34	3.34	34.15	4.37	0.00	34.97	29.81	32.97	29.85
k, delay calibration	0.08	0.50	0.50	0.08	0.50	0.50	0.08	0.08	0.08	0.08
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.05	0.28	0.29	6.66	0.08	0.00	0.85	0.23	1.07	0.30
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.53	0.15	0.16	0.35	0.09	0.00	0.23	0.09	0.37	0.11
d, Delay for Lane Group [s/veh]	34.67	3.62	3.63	40.81	4.46	0.00	35.82	30.04	34.03	30.15
Lane Group LOS	C	A	A	D	A	A	D	C	C	C
Critical Lane Group	no	no	yes	yes	no	no	no	no	yes	no
50th-Percentile Queue Length [veh]	0.96	0.62	0.61	0.17	0.37	0.00	0.43	0.18	1.03	0.19
50th-Percentile Queue Length [ft]	24.06	15.51	15.20	4.28	9.32	0.00	10.86	4.41	25.65	4.84
95th-Percentile Queue Length [veh]	1.73	1.12	1.09	0.31	0.67	0.00	0.78	0.32	1.85	0.35
95th-Percentile Queue Length [ft]	43.30	27.92	27.35	7.71	16.78	0.00	19.55	7.94	46.17	8.71

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.67	3.62	3.63	40.81	4.46	0.00	35.82	30.04	30.04	34.03	34.03	30.15
Movement LOS	C	A	A	D	A	A	D	C	C	C	C	C
d_A, Approach Delay [s/veh]	7.78			5.97			34.00			33.38		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	11.11											
Intersection LOS	B											
Intersection V/C	0.191											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

The delay reported in the traffic study is higher than that calculated in this worksheet as the calculated delay is lower than the comparable previous scenario. This is due to the HCM 2010 methodology which reports delay as the average delay of all vehicles at the intersection. The lower delay in this scenario is due to the fact that the added volumes are to movements experiencing lower delays than most.

Intersection Level Of Service Report
#91: Pats Ranch Road / Driveway 1

Control Type:	Two-way stop	Delay (sec / veh):	9.0
Analysis Method:	HCM2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.022

Intersection Setup

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	150.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		yes	

Volumes

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Base Volume Input [veh/h]	0	320	179	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	114	14	14	0	18
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	447	200	14	0	18
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	121	54	4	0	5
Total Analysis Volume [veh/h]	0	486	217	15	0	20
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.02
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	9.03
Movement LOS		A	A	A		A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.07
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	1.68
d_A, Approach Delay [s/veh]	0.00		0.00		9.03	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.24					
Intersection LOS	A					

Intersection Level Of Service Report
#92: Pats Ranch Road / Ivory Street

Control Type:	Two-way stop	Delay (sec / veh):	19.1
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 2			Ivory Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	150.00	100.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 2			Ivory Street		
Base Volume Input [veh/h]	0	237	48	33	146	0	0	0	0	72	0	83
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	12	0	0	0	18	14	114	0	30	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	246	50	34	170	14	114	0	30	75	0	86
Peak Hour Factor	0.6820	0.6820	0.6820	0.6820	0.6820	0.6820	0.6820	0.6820	0.6820	0.6820	0.6820	0.6820
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	90	18	12	62	5	42	0	11	27	0	32
Total Analysis Volume [veh/h]	18	361	73	50	249	21	167	0	44	110	0	126
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			no	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			yes	yes
Number of Storage Spaces in Median	0	0	2	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.04	0.00	0.00	0.38	0.00	0.05	0.24	0.00	0.16
d_M, Delay for Movement [s/veh]	7.83	0.00	0.00	8.36	0.00	0.00	18.69	19.10	14.51	15.28	15.54	10.44
Movement LOS	A	A	A	A	A	A	C	C	B	C	C	B
95th-Percentile Queue Length [veh]	0.04	0.00	0.00	0.14	0.00	0.00	2.14	2.14	2.14	0.92	0.92	0.57
95th-Percentile Queue Length [ft]	1.06	0.00	0.00	3.49	0.00	0.00	53.58	53.58	53.58	23.12	23.12	14.19
d_A, Approach Delay [s/veh]	0.31			1.31			17.82			12.70		
Approach LOS	A			A			C			B		
d_I, Intersection Delay [s/veh]	6.00											
Intersection LOS	C											

Intersection Level Of Service Report
#93: Pats Ranch Road / 68th Street

Control Type:	All-way stop	Delay (sec / veh):	65.8
Analysis Method:	HCM2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Pats Ranch Road		68th Street		68th Street	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1
Pocket Length [ft]	100.00	100.00	200.00	100.00	100.00	220.00
Speed [mph]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	yes		no		no	

Volumes

Name	Pats Ranch Road		68th Street		68th Street	
Base Volume Input [veh/h]	25	193	250	407	379	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	40	10	0	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	241	270	423	394	38
Peak Hour Factor	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	82	91	143	133	13
Total Analysis Volume [veh/h]	46	326	365	572	533	51
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.39	5.71	8.25	23.23	3.92	3.92	0.35
95th-Percentile Queue Length [ft]	9.83	142.83	206.20	580.68	97.99	97.99	8.86
Approach Delay [s/veh]	26.83		108.80		21.74		
Approach LOS	D		F		C		
Intersection Delay [s/veh]	65.84						
Intersection LOS	F						

Intersection Level Of Service Report
#94: Wineville Avenue / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	19.3
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.385

Intersection Setup

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Pocket Length [ft]	185.00	100.00	100.00	100.00	100.00	100.00	250.00	100.00	360.00	245.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Base Volume Input [veh/h]	56	105	46	40	77	120	69	532	48	26	812	29
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	24	0	0	6	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	24	0	0	0
Total Hourly Volume [veh/h]	58	109	48	42	80	125	72	577	26	27	850	30
Peak Hour Factor	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	29	13	11	21	33	19	154	7	7	227	8
Total Analysis Volume [veh/h]	62	116	51	45	85	133	77	615	28	29	906	32
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	26.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	5	0	4	5	0	4	6	0	4	6	0
Maximum Green [s]	37	58	0	37	58	0	20	0	0	75	0	0
Amber [s]	3.0	4.3	0.0	3.0	4.3	0.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0
Split [s]	11	32	0	11	32	0	9	29	0	8	28	0
Vehicle Extension [s]	1.5	2.0	0.0	1.5	2.0	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Walk [s]	0	5	0	0	5	0	0	10	0	0	10	0
Pedestrian Clearance [s]	0	21	0	0	16	0	0	13	0	0	12	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	1.5	3.3	0.0	1.5	3.3	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	no		no	no		no	yes		no	yes	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	L	C	R	L	C	C
L, Total Lost Time per Cycle [s]	3.50	5.30	5.30	3.50	5.30	3.50	6.00	6.00	3.50	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.50	3.30	3.30	1.50	3.30	1.50	4.00	4.00	1.50	4.00	4.00
g_i, Effective Green Time [s]	4	13	13	3	12	4	44	44	2	41	41
g / C, Green / Cycle	0.05	0.17	0.17	0.03	0.15	0.06	0.55	0.55	0.02	0.52	0.52
(v / s)_i Volume / Saturation Flow Rate	0.03	0.04	0.04	0.03	0.13	0.04	0.17	0.02	0.02	0.18	0.18
s, saturation flow rate [veh/h]	1774	1863	1662	1774	1682	1774	3547	1583	1774	1863	1831
c, Capacity [veh/h]	80	310	277	58	258	100	1943	867	44	962	946
d1, Uniform Delay [s]	37.82	29.05	29.14	38.47	32.98	37.30	9.90	8.33	38.72	11.38	11.38
k, delay calibration	0.04	0.04	0.04	0.04	0.04	0.04	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.68	0.16	0.19	8.25	2.92	4.68	0.43	0.07	6.08	0.97	0.99
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.77	0.25	0.27	0.78	0.84	0.77	0.32	0.03	0.66	0.34	0.34
d, Delay for Lane Group [s/veh]	43.51	29.21	29.33	46.72	35.89	41.98	10.33	8.40	44.81	12.35	12.36
Lane Group LOS	D	C	C	D	D	D	B	A	D	B	B
Critical Lane Group	yes	no	no	no	yes	yes	no	no	no	no	yes
50th-Percentile Queue Length [veh]	1.26	1.23	1.18	0.96	4.03	1.53	2.52	0.20	0.60	2.95	2.90
50th-Percentile Queue Length [ft]	31.56	30.87	29.53	24.03	100.84	38.31	63.00	5.02	14.89	73.63	72.48
95th-Percentile Queue Length [veh]	2.27	2.22	2.13	1.73	7.26	2.76	4.54	0.36	1.07	5.30	5.22
95th-Percentile Queue Length [ft]	56.81	55.57	53.15	43.25	181.51	68.97	113.39	9.04	26.80	132.54	130.47

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	43.51	29.24	29.33	46.72	35.89	35.89	41.98	10.33	8.40	44.81	12.35	12.36
Movement LOS	D	C	C	D	D	D	D	B	A	D	B	B
d_A, Approach Delay [s/veh]	33.38			37.75			13.64			13.73		
Approach LOS	C			D			B			B		
d_I, Intersection Delay [s/veh]	19.30											
Intersection LOS	B											
Intersection V/C	0.385											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

The delay reported in the traffic study is higher than that calculated in this worksheet as the calculated delay is lower than the comparable previous scenario. This is due to the HCM 2010 methodology which reports delay as the average delay of all vehicles at the intersection. The lower delay in this scenario is due to the fact that the added volumes are to movements experiencing lower delays than most.

Intersection Level Of Service Report
#86: Hamner Avenue / 68th Street

Control Type:	Signalized	Delay (sec / veh):	30.5
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.411

Intersection Setup

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	280.00	100.00	100.00	250.00	100.00	100.00	200.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Base Volume Input [veh/h]	49	631	182	45	537	71	56	91	38	157	143	72
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	16	16	0	0	0	8	0	9	4	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	72	0	0	16	0	0	10	0	0	38
Total Hourly Volume [veh/h]	51	656	133	63	558	58	58	103	30	172	153	46
Peak Hour Factor	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	185	38	18	158	16	16	29	8	49	43	13
Total Analysis Volume [veh/h]	58	741	150	71	631	66	66	116	34	194	173	52
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0
All red [s]	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Split [s]	12	34	0	12	34	0	17	34	0	20	37	0
Vehicle Extension [s]	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	L	C	R
L, Total Lost Time per Cycle [s]	5.00	7.00	7.00	5.00	7.00	7.00	5.00	7.00	5.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	5.00	5.00	3.00	5.00	5.00	3.00	5.00	3.00	5.00	5.00
g_i, Effective Green Time [s]	6	45	45	6	45	45	6	12	14	19	19
g / C, Green / Cycle	0.06	0.45	0.45	0.06	0.45	0.45	0.06	0.12	0.14	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.04	0.15	0.15	0.04	0.12	0.12	0.04	0.09	0.12	0.10	0.04
s, saturation flow rate [veh/h]	1597	3192	1502	1597	3192	1581	1597	1612	1597	1676	1425
c, Capacity [veh/h]	89	1426	671	96	1440	713	94	186	219	326	277
d1, Uniform Delay [s]	46.22	17.99	18.03	46.19	17.10	17.13	46.18	43.11	42.31	36.17	33.67
k, delay calibration	0.04	0.50	0.50	0.04	0.50	0.50	0.04	0.23	0.20	0.23	0.23
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.95	0.64	1.38	4.12	0.45	0.93	3.58	15.77	18.51	2.86	0.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

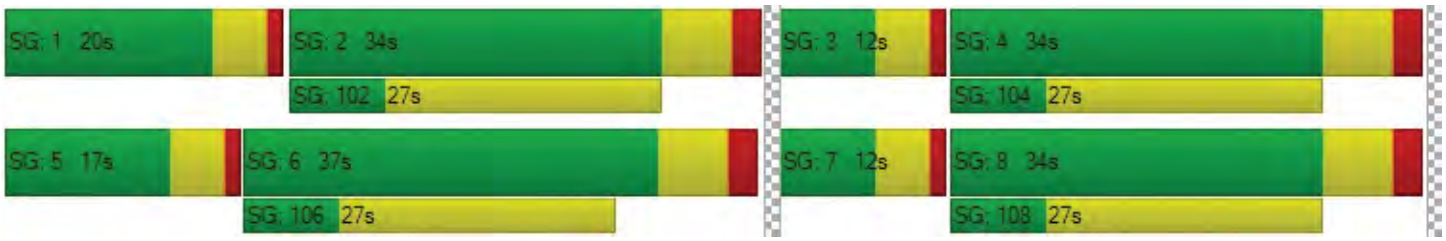
X, volume / capacity	0.65	0.34	0.34	0.74	0.27	0.27	0.70	0.81	0.88	0.53	0.19
d, Delay for Lane Group [s/veh]	49.17	18.63	19.41	50.31	17.55	18.06	49.76	58.88	60.82	39.03	34.36
Lane Group LOS	D	B	B	D	B	B	D	E	E	D	C
Critical Lane Group	no	no	yes	yes	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	1.44	3.46	3.44	1.78	2.63	2.74	1.65	4.29	5.63	3.88	1.07
50th-Percentile Queue Length [ft]	35.91	86.47	86.04	44.60	65.83	68.48	41.18	107.17	140.66	97.08	26.69
95th-Percentile Queue Length [veh]	2.59	6.23	6.19	3.21	4.74	4.93	2.96	7.68	9.52	6.99	1.92
95th-Percentile Queue Length [ft]	64.63	155.64	154.87	80.28	118.50	123.27	74.12	192.06	237.91	174.74	48.03

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	49.17	18.74	19.41	50.31	17.68	18.06	49.76	58.88	58.88	60.82	39.03	34.36
Movement LOS	D	B	B	D	B	B	D	E	E	E	D	C
d_A, Approach Delay [s/veh]	21.17			21.31			56.09			48.54		
Approach LOS	C			C			E			D		
d_I, Intersection Delay [s/veh]	30.50											
Intersection LOS	C											
Intersection V/C	0.411											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
#90: Pats Ranch Road / 65th Street

Control Type:	Signalized	Delay (sec / veh):	10.7
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.256

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	90.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Base Volume Input [veh/h]	50	184	23	34	202	5	22	2	24	18	7	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	59	0	0	112	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	18	0	0	18
Total Hourly Volume [veh/h]	52	250	24	35	322	5	23	2	7	19	7	4
Peak Hour Factor	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	83	8	12	107	2	8	1	2	6	2	1
Total Analysis Volume [veh/h]	69	332	32	46	428	7	31	3	9	25	9	5
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	0	1	6	0	0	4	0	0	8	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.6	3.6	0.0	3.6	3.6	0.0	0.0	3.6	0.0	0.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	12	27	0	12	27	0	0	31	0	0	31	0
Vehicle Extension [s]	2.5	2.5	0.0	2.5	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	15	0	0	15	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.6	2.6	0.0	2.6	2.6	0.0	0.0	2.6	0.0	0.0	2.6	0.0
Minimum Recall	no	no		no	no			no			no	
Maximum Recall	no	yes		no	yes			no			no	
Pedestrian Recall	no	no		no	no			no			no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	5	48	48	4	47	47	4	4	4	4
g / C, Green / Cycle	0.07	0.69	0.69	0.06	0.68	0.68	0.05	0.05	0.05	0.05
(v / s)_i Volume / Saturation Flow Rate	0.04	0.09	0.09	0.03	0.13	0.00	0.02	0.01	0.08	0.00
s, saturation flow rate [veh/h]	1597	1676	1613	1597	3192	1425	1260	1481	432	1425
c, Capacity [veh/h]	116	1160	1116	93	2161	965	103	77	112	75
d1, Uniform Delay [s]	31.34	3.64	3.64	31.86	4.20	3.66	34.89	31.59	34.30	31.45
k, delay calibration	0.08	0.50	0.50	0.08	0.50	0.50	0.08	0.08	0.08	0.08
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.53	0.23	0.24	3.00	0.21	0.01	1.19	0.68	1.12	0.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.59	0.13	0.13	0.49	0.20	0.01	0.30	0.15	0.30	0.07
d, Delay for Lane Group [s/veh]	34.87	3.86	3.88	34.87	4.41	3.67	36.08	32.27	35.41	31.73
Lane Group LOS	C	A	A	C	A	A	D	C	D	C
Critical Lane Group	yes	no	no	no	yes	no	no	no	yes	no
50th-Percentile Queue Length [veh]	1.19	0.54	0.53	0.80	0.84	0.03	0.57	0.21	0.61	0.08
50th-Percentile Queue Length [ft]	29.68	13.45	13.18	19.89	21.12	0.65	14.16	5.13	15.19	2.12
95th-Percentile Queue Length [veh]	2.14	0.97	0.95	1.43	1.52	0.05	1.02	0.37	1.09	0.15
95th-Percentile Queue Length [ft]	53.43	24.22	23.73	35.81	38.02	1.17	25.48	9.23	27.34	3.81

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.87	3.87	3.88	34.87	4.41	3.67	36.08	32.27	32.27	35.41	35.41	31.73
Movement LOS	C	A	A	C	A	A	D	C	C	D	D	C
d_A, Approach Delay [s/veh]	9.82			7.31			35.02			34.94		
Approach LOS	A			A			D			C		
d_I, Intersection Delay [s/veh]	10.75											
Intersection LOS	B											
Intersection V/C	0.256											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

The delay reported in the traffic study is higher than that calculated in this worksheet as the calculated delay is lower than the comparable previous scenario. This is due to the HCM 2010 methodology which reports delay as the average delay of all vehicles at the intersection. The lower delay in this scenario is due to the fact that the added volumes are to movements experiencing lower delays than most.

Intersection Level Of Service Report
#91: Pats Ranch Road / Driveway 1

Control Type:	Two-way stop	Delay (sec / veh):	9.5
Analysis Method:	HCM2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.014

Intersection Setup

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	150.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		yes	

Volumes

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Base Volume Input [veh/h]	0	257	244	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	59	56	56	0	10
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	326	310	56	0	10
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	89	84	15	0	3
Total Analysis Volume [veh/h]	0	354	337	61	0	11
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	9.51
Movement LOS		A	A	A		A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.04
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	1.03
d_A, Approach Delay [s/veh]	0.00		0.00		9.51	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.14					
Intersection LOS	A					

Intersection Level Of Service Report
#92: Pats Ranch Road / Ivory Street

Control Type:	Two-way stop	Delay (sec / veh):	20.2
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.274

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 2			Ivory Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	150.00	100.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 2			Ivory Street		
Base Volume Input [veh/h]	0	165	63	49	195	0	0	0	0	64	0	92
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	48	0	0	0	10	56	59	0	16	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	48	172	66	51	213	56	59	0	16	67	0	96
Peak Hour Factor	0.6630	0.6630	0.6630	0.6630	0.6630	0.6630	0.6630	0.6630	0.6630	0.6630	0.6630	0.6630
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	65	25	19	80	21	22	0	6	25	0	36
Total Analysis Volume [veh/h]	72	259	100	77	321	84	89	0	24	101	0	145
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			no	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			yes	yes
Number of Storage Spaces in Median	0	0	2	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.00	0.00	0.06	0.00	0.00	0.27	0.00	0.03	0.25	0.00	0.17
d_M, Delay for Movement [s/veh]	8.34	0.00	0.00	8.22	0.00	0.00	20.24	19.95	13.64	17.07	19.00	10.23
Movement LOS	A	A	A	A	A	A	C	C	B	C	C	B
95th-Percentile Queue Length [veh]	0.20	0.00	0.00	0.21	0.00	0.00	1.26	1.26	1.26	0.99	0.99	0.63
95th-Percentile Queue Length [ft]	5.00	0.00	0.00	5.15	0.00	0.00	31.48	31.48	31.48	24.79	24.79	15.71
d_A, Approach Delay [s/veh]	1.39			1.31			18.83			13.04		
Approach LOS	A			A			C			B		
d_I, Intersection Delay [s/veh]	5.16											
Intersection LOS	C											

Intersection Level Of Service Report
#93: Pats Ranch Road / 68th Street

Control Type:	All-way stop	Delay (sec / veh):	32.9
Analysis Method:	HCM2010	Level Of Service:	D
Analysis Period:	15 minutes		

Intersection Setup

Name	Pats Ranch Road		68th Street		68th Street	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1
Pocket Length [ft]	100.00	100.00	200.00	100.00	100.00	220.00
Speed [mph]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	yes		no		no	

Volumes

Name	Pats Ranch Road		68th Street		68th Street	
Base Volume Input [veh/h]	28	231	187	253	307	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	4	22	40	0	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	262	234	263	319	51
Peak Hour Factor	0.6780	0.6780	0.6780	0.6780	0.6780	0.6780
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	97	86	97	118	19
Total Analysis Volume [veh/h]	49	386	345	388	471	75
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.41	8.13	7.47	8.74	3.22	3.22	0.56
95th-Percentile Queue Length [ft]	10.33	203.37	186.67	218.52	80.40	80.40	14.09
Approach Delay [s/veh]	35.78		41.16		19.56		
Approach LOS	E		E		C		
Intersection Delay [s/veh]	32.92						
Intersection LOS	D						

Intersection Level Of Service Report
#86: Hamner Avenue / 68th Street

Control Type:	Signalized	Delay (sec / veh):	31.1
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.425

Intersection Setup

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	280.00	100.00	100.00	250.00	100.00	100.00	200.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Base Volume Input [veh/h]	69	636	188	96	561	60	56	106	34	161	129	76
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	16	16	0	0	0	8	0	9	4	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	77	0	0	34	0	0	11	0	0	38
Total Hourly Volume [veh/h]	72	661	135	116	583	28	58	118	24	176	138	50
Peak Hour Factor	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	172	35	30	151	7	15	31	6	46	36	13
Total Analysis Volume [veh/h]	75	686	140	120	605	29	60	123	25	183	143	52
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0
All red [s]	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Split [s]	12	34	0	12	34	0	18	34	0	20	36	0
Vehicle Extension [s]	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	L	C	R
L, Total Lost Time per Cycle [s]	5.00	7.00	7.00	5.00	7.00	7.00	5.00	7.00	5.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	5.00	5.00	3.00	5.00	5.00	3.00	5.00	3.00	5.00	5.00
g_i, Effective Green Time [s]	6	42	42	9	45	45	6	11	13	19	19
g / C, Green / Cycle	0.06	0.42	0.42	0.09	0.45	0.45	0.06	0.11	0.13	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.05	0.14	0.14	0.08	0.12	0.12	0.04	0.09	0.11	0.09	0.04
s, saturation flow rate [veh/h]	1597	3192	1506	1597	3192	1633	1597	1628	1597	1676	1425
c, Capacity [veh/h]	98	1358	640	144	1451	742	90	184	209	314	267
d1, Uniform Delay [s]	46.21	19.24	19.28	44.69	16.82	16.84	46.20	43.22	42.64	36.07	34.24
k, delay calibration	0.04	0.50	0.50	0.04	0.50	0.50	0.04	0.23	0.17	0.23	0.23
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.68	0.67	1.44	4.62	0.43	0.84	3.08	15.62	15.79	2.19	0.75
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

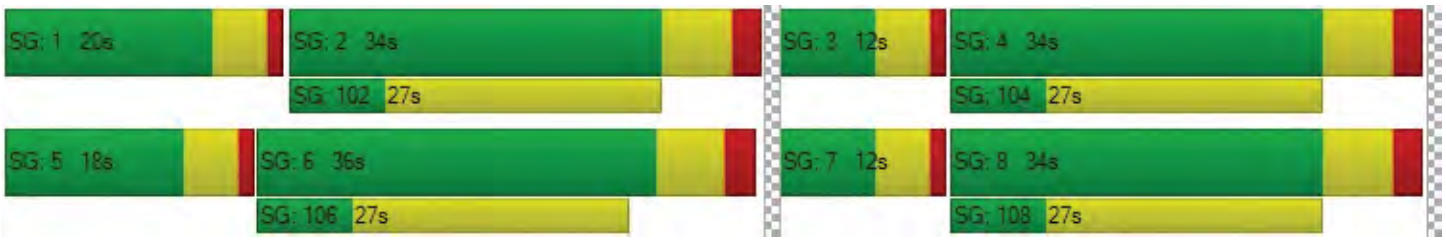
X, volume / capacity	0.77	0.33	0.34	0.83	0.26	0.26	0.66	0.80	0.88	0.46	0.19
d, Delay for Lane Group [s/veh]	50.89	19.90	20.72	49.31	17.25	17.68	49.29	58.84	58.43	38.26	34.99
Lane Group LOS	D	B	C	D	B	B	D	E	E	D	C
Critical Lane Group	no	no	yes	yes	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	1.90	3.42	3.41	3.00	2.54	2.70	1.49	4.23	5.16	3.16	1.08
50th-Percentile Queue Length [ft]	47.45	85.38	85.36	74.97	63.42	67.46	37.20	105.68	129.11	78.97	27.00
95th-Percentile Queue Length [veh]	3.42	6.15	6.15	5.40	4.57	4.86	2.68	7.60	8.89	5.69	1.94
95th-Percentile Queue Length [ft]	85.40	153.68	153.64	134.95	114.15	121.43	66.97	189.98	222.28	142.15	48.61

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	50.89	20.02	20.72	49.31	17.38	17.68	49.29	58.84	58.84	58.43	38.26	34.99
Movement LOS	D	C	C	D	B	B	D	E	E	E	D	C
d_A, Approach Delay [s/veh]	23.25			22.99			56.08			47.57		
Approach LOS	C			C			E			D		
d_I, Intersection Delay [s/veh]	31.10											
Intersection LOS	C											
Intersection V/C	0.425											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1132	459	449	899	0	0	0	0	257	1	561
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0.0	186.3	186.3	188.1	186.3	0.0				186.3	188.0	188.1
Adj Flow Rate, veh/h	0	1192	483	473	946	0				181	0	688
Adj No. of Lanes	0	2	1	2	2	0				1	0	2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	1	2	0				2	0	1
Cap, veh/h	0	1685	754	557	2397	0				395	0	707
Arrive On Green	0.00	0.48	0.48	0.05	0.22	0.00				0.22	0.00	0.22
Sat Flow, veh/h	0	3632	1583	3476	3632	0				1774	0	3176
Grp Volume(v), veh/h	0	1192	483	473	946	0				181	0	688
Grp Sat Flow(s),veh/h/ln	0	1770	1583	1738	1770	0				1774	0	1588
Q Serve(g_s), s	0.0	29.3	25.3	14.8	25.0	0.0				9.7	0.0	23.6
Cycle Q Clear(g_c), s	0.0	29.3	25.3	14.8	25.0	0.0				9.7	0.0	23.6
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1685	754	557	2397	0				395	0	707
V/C Ratio(X)	0.00	0.71	0.64	0.85	0.39	0.00				0.46	0.00	0.97
Avail Cap(c_a), veh/h	0	1685	754	1122	2397	0				395	0	707
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.66	0.66	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	22.8	21.7	50.8	23.5	0.0				37.0	0.0	42.4
Incr Delay (d2), s/veh	0.0	1.2	1.4	1.0	0.3	0.0				0.3	0.0	26.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.5	11.3	7.2	12.4	0.0				4.8	0.0	13.0
LnGrp Delay(d),s/veh	0.0	23.9	23.2	51.7	23.8	0.0				37.3	0.0	69.3
LnGrp LOS		C	C	D	C					D		E
Approach Vol, veh/h		1675			1419						869	
Approach Delay, s/veh		23.7			33.1						62.6	
Approach LOS		C			C						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	22.1	57.9		30.0		80.0		
Change Period (Y+Rc), s	4.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	35.5	34.5		24.5		74.5		
Max Q Clear Time (g_c+I1), s	16.8	31.3		25.6		27.0		
Green Ext Time (p_c), s	0.8	2.6		0.0		15.1		

Intersection Summary	
HCM 2010 Ctrl Delay	35.6
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	420	968	0	0	1003	269	345	18	657	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	184.5	186.3	0.0	0.0	188.1	188.1	186.3	188.0	188.1			
Adj Flow Rate, veh/h	438	1008	0	0	1045	280	246	0	818			
Adj No. of Lanes	2	2	0	0	2	1	1	0	2			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	2	0	0	1	1	2	0	1			
Cap, veh/h	530	2397	0	0	1718	766	395	0	712			
Arrive On Green	0.16	0.68	0.00	0.00	0.48	0.48	0.22	0.00	0.22			
Sat Flow, veh/h	3408	3632	0	0	3668	1594	1774	0	3198			
Grp Volume(v), veh/h	438	1008	0	0	1045	280	246	0	818			
Grp Sat Flow(s),veh/h/ln	1704	1770	0	0	1787	1594	1774	0	1599			
Q Serve(g_s), s	13.7	14.1	0.0	0.0	23.6	12.2	13.8	0.0	24.5			
Cycle Q Clear(g_c), s	13.7	14.1	0.0	0.0	23.6	12.2	13.8	0.0	24.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	530	2397	0	0	1718	766	395	0	712			
V/C Ratio(X)	0.83	0.42	0.00	0.00	0.61	0.37	0.62	0.00	1.15			
Avail Cap(c_a), veh/h	1100	2397	0	0	1718	766	395	0	712			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.65	0.65	0.00	0.00	0.90	0.90	1.00	0.00	1.00			
Uniform Delay (d), s/veh	45.0	8.0	0.0	0.0	21.0	18.0	38.6	0.0	42.8			
Incr Delay (d2), s/veh	2.2	0.4	0.0	0.0	1.5	1.2	7.2	0.0	82.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	6.6	7.0	0.0	0.0	12.0	5.6	7.6	0.0	19.0			
LnGrp Delay(d),s/veh	47.2	8.4	0.0	0.0	22.4	19.2	45.8	0.0	125.3			
LnGrp LOS	D	A			C	B	D		F			
Approach Vol, veh/h		1446			1325			1064				
Approach Delay, s/veh		20.1			21.7			107.0				
Approach LOS		C			C			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		80.0			21.6	58.4		30.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.5
Max Green Setting (Gmax), s		74.5			35.5	34.5		24.5
Max Q Clear Time (g_c+I1), s		16.1			15.7	25.6		26.5
Green Ext Time (p_c), s		13.4			1.4	5.9		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	44.8
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Intersection Level Of Service Report
#89: Pats Ranch Road / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	18.1
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.652

Intersection Setup

Name	Pats Ranch Road		Limonite Avenue		Limonite Avenue	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	210.00	100.00	100.00	100.00	170.00	100.00
Speed [mph]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	yes		no		no	

Volumes

Name	Pats Ranch Road		Limonite Avenue		Limonite Avenue	
Base Volume Input [veh/h]	302	151	1039	229	218	880
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	42	13	0	80	24	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	64	0	87	0	0
Total Hourly Volume [veh/h]	356	106	1081	231	251	915
Peak Hour Factor	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	95	28	289	62	67	244
Total Analysis Volume [veh/h]	380	113	1155	247	268	978
Presence of On-Street Parking	no	no	no	no	no	no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Protected	Permissive
Signal Group	3	0	2	0	1	6
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	6	0	6	0	5	6
Maximum Green [s]	0	0	0	0	0	0
Amber [s]	3.6	0.0	4.7	0.0	3.2	4.7
All red [s]	1.0	0.0	1.0	0.0	1.0	1.0
Split [s]	14	0	30	0	21	51
Vehicle Extension [s]	2.5	0.0	3.0	0.0	1.5	3.0
Walk [s]	0	0	11	0	0	0
Pedestrian Clearance [s]	0	0	13	0	0	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.6	0.0	3.7	0.0	2.2	3.7
Minimum Recall	no		no		no	no
Maximum Recall	no		yes		no	yes
Pedestrian Recall	no		no		no	no
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	R	C	R	L	C
L, Total Lost Time per Cycle [s]	4.60	4.60	5.70	5.70	4.20	5.70
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	3.70	3.70	2.20	3.70
g_i, Effective Green Time [s]	9	9	29	29	13	45
g / C, Green / Cycle	0.14	0.14	0.44	0.44	0.19	0.70
(v / s)_i Volume / Saturation Flow Rate	0.12	0.08	0.36	0.17	0.17	0.31
s, saturation flow rate [veh/h]	3101	1425	3192	1425	1597	3192
c, Capacity [veh/h]	448	206	1406	628	306	2225
d1, Uniform Delay [s]	27.09	25.82	15.93	12.30	25.49	4.30
k, delay calibration	0.08	0.08	0.50	0.50	0.11	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.44	1.69	5.51	1.85	7.80	0.63
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

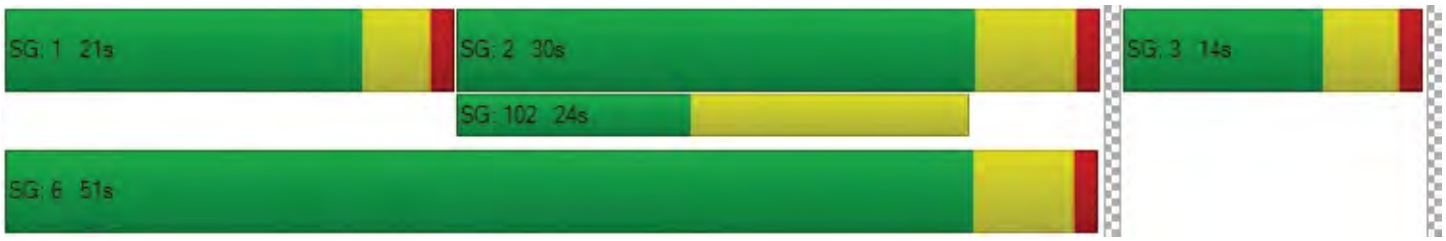
X, volume / capacity	0.85	0.55	0.82	0.39	0.87	0.44
d, Delay for Lane Group [s/veh]	30.54	27.52	21.44	14.14	33.28	4.93
Lane Group LOS	C	C	C	B	C	A
Critical Lane Group	yes	no	yes	no	yes	no
50th-Percentile Queue Length [veh]	2.88	1.61	7.00	2.28	4.21	1.54
50th-Percentile Queue Length [ft]	72.10	40.25	174.97	56.94	105.22	38.45
95th-Percentile Queue Length [veh]	5.19	2.90	11.34	4.10	7.57	2.77
95th-Percentile Queue Length [ft]	129.78	72.46	283.43	102.50	189.34	69.21

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	30.54	27.52	21.44	14.14	33.28	4.93
Movement LOS	C	C	C	B	C	A
d_A, Approach Delay [s/veh]	29.85		20.15		11.03	
Approach LOS	C		C		B	
d_I, Intersection Delay [s/veh]	18.05					
Intersection LOS	B					
Intersection V/C	0.652					

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
#90: Pats Ranch Road / 65th Street

Control Type:	Signalized	Delay (sec / veh):	13.4
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.245

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	90.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Base Volume Input [veh/h]	81	114	10	51	250	8	34	6	27	7	22	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	59	0	0	112	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	15	0	0	14
Total Hourly Volume [veh/h]	84	178	10	53	372	8	35	6	13	7	23	6
Peak Hour Factor	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	52	3	15	108	2	10	2	4	2	7	2
Total Analysis Volume [veh/h]	98	207	12	62	433	9	41	7	15	8	27	7
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	0	1	6	0	0	4	0	0	8	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.6	3.6	0.0	3.6	3.6	0.0	0.0	3.6	0.0	0.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	12	27	0	12	27	0	0	31	0	0	31	0
Vehicle Extension [s]	2.5	2.5	0.0	2.5	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	15	0	0	15	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.6	2.6	0.0	2.6	2.6	0.0	0.0	2.6	0.0	0.0	2.6	0.0
Minimum Recall	no	no		no	no			no			no	
Maximum Recall	no	yes		no	yes			no			no	
Pedestrian Recall	no	no		no	no			no			no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	6	47	47	5	46	46	4	4	4	4
g / C, Green / Cycle	0.08	0.68	0.68	0.07	0.66	0.66	0.06	0.06	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.06	0.06	0.06	0.04	0.14	0.01	0.03	0.01	0.05	0.00
s, saturation flow rate [veh/h]	1597	1676	1644	1597	3192	1425	1240	1496	725	1425
c, Capacity [veh/h]	135	1137	1115	110	2116	945	103	82	103	78
d1, Uniform Delay [s]	31.17	3.86	3.86	31.45	4.59	3.99	34.89	31.63	32.55	31.32
k, delay calibration	0.08	0.50	0.50	0.08	0.50	0.50	0.08	0.08	0.08	0.08
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.48	0.16	0.17	3.29	0.22	0.02	1.82	1.28	1.43	0.36
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.73	0.09	0.09	0.56	0.20	0.01	0.40	0.27	0.34	0.09
d, Delay for Lane Group [s/veh]	36.64	4.02	4.03	34.75	4.80	4.01	36.71	32.91	33.98	31.68
Lane Group LOS	D	A	A	C	A	A	D	C	C	C
Critical Lane Group	yes	no	no	no	yes	no	no	no	yes	no
50th-Percentile Queue Length [veh]	1.74	0.41	0.41	1.07	0.93	0.04	0.76	0.38	0.62	0.12
50th-Percentile Queue Length [ft]	43.39	10.29	10.21	26.64	23.15	0.90	19.05	9.48	15.57	2.95
95th-Percentile Queue Length [veh]	3.12	0.74	0.74	1.92	1.67	0.06	1.37	0.68	1.12	0.21
95th-Percentile Queue Length [ft]	78.10	18.52	18.38	47.95	41.68	1.62	34.30	17.07	28.03	5.32

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	36.64	4.03	4.03	34.75	4.80	4.01	36.71	32.91	32.91	33.98	33.98	31.68
Movement LOS	D	A	A	C	A	A	D	C	C	C	C	C
d_A, Approach Delay [s/veh]	14.31			8.47			35.38			33.59		
Approach LOS	B			A			D			C		
d_I, Intersection Delay [s/veh]	13.44											
Intersection LOS	B											
Intersection V/C	0.245											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

The delay reported in the traffic study is higher than that calculated in this worksheet as the calculated delay is lower than the comparable previous scenario. This is due to the HCM 2010 methodology which reports delay as the average delay of all vehicles at the intersection. The lower delay in this scenario is due to the fact that the added volumes are to movements experiencing lower delays than most.

Intersection Level Of Service Report
#91: Pats Ranch Road / Driveway 1

Control Type:	Two-way stop	Delay (sec / veh):	9.7
Analysis Method:	HCM2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.014

Intersection Setup

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	150.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		yes	

Volumes

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Base Volume Input [veh/h]	0	205	284	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	59	56	56	0	10
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	272	351	56	0	10
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	74	95	15	0	3
Total Analysis Volume [veh/h]	0	296	382	61	0	11
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	9.67
Movement LOS		A	A	A		A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.04
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	1.07
d_A, Approach Delay [s/veh]	0.00		0.00		9.67	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.14					
Intersection LOS	A					

Intersection Level Of Service Report
#92: Pats Ranch Road / Ivory Street

Control Type:	Two-way stop	Delay (sec / veh):	14.9
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 2			Ivory Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	150.00	100.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 2			Ivory Street		
Base Volume Input [veh/h]	0	189	16	27	257	0	0	0	0	6	0	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	48	0	0	0	10	56	59	0	16	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	48	197	17	28	277	56	59	0	16	6	0	17
Peak Hour Factor	0.8290	0.8290	0.8290	0.8290	0.8290	0.8290	0.8290	0.8290	0.8290	0.8290	0.8290	0.8290
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	59	5	8	84	17	18	0	5	2	0	5
Total Analysis Volume [veh/h]	58	238	21	34	334	68	71	0	19	7	0	21
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			no	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			yes	yes
Number of Storage Spaces in Median	0	0	2	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.00	0.00	0.03	0.00	0.00	0.15	0.00	0.02	0.01	0.00	0.02
d_M, Delay for Movement [s/veh]	8.29	0.00	0.00	7.84	0.00	0.00	14.38	14.91	11.00	12.43	14.02	9.11
Movement LOS	A	A	A	A	A	A	B	B	B	B	B	A
95th-Percentile Queue Length [veh]	0.16	0.00	0.00	0.08	0.00	0.00	0.64	0.64	0.64	0.04	0.04	0.07
95th-Percentile Queue Length [ft]	3.97	0.00	0.00	2.01	0.00	0.00	16.06	16.06	16.06	1.08	1.08	1.80
d_A, Approach Delay [s/veh]	1.52			0.61			13.66			9.94		
Approach LOS	A			A			B			A		
d_I, Intersection Delay [s/veh]	2.59											
Intersection LOS	B											

Intersection Level Of Service Report
#93: Pats Ranch Road / 68th Street

Control Type:	All-way stop	Delay (sec / veh):	15.5
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Pats Ranch Road		68th Street		68th Street	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	1
Pocket Length [ft]	100.00	100.00	200.00	100.00	100.00	220.00
Speed [mph]	35.00		45.00		45.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	yes		no		no	

Volumes

Name	Pats Ranch Road		68th Street		68th Street	
Base Volume Input [veh/h]	30	233	189	232	209	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	4	22	40	0	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	264	237	241	217	25
Peak Hour Factor	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	78	70	71	64	7
Total Analysis Volume [veh/h]	41	311	279	284	256	29
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.28	3.27	3.30	2.98	1.01	1.01	0.16
95th-Percentile Queue Length [ft]	6.96	81.65	82.39	74.60	25.24	25.24	4.12
Approach Delay [s/veh]	15.68		17.19		12.07		
Approach LOS	C		C		B		
Intersection Delay [s/veh]	15.53						
Intersection LOS	C						

Intersection Level Of Service Report
#94: Wineville Avenue / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	27.3
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.566

Intersection Setup

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Pocket Length [ft]	185.00	100.00	100.00	100.00	100.00	100.00	250.00	100.00	360.00	245.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Base Volume Input [veh/h]	51	46	33	127	90	194	169	956	65	52	853	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	13	0	0	24	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	32	0	0	0
Total Hourly Volume [veh/h]	53	48	34	132	94	202	176	1007	36	54	911	77
Peak Hour Factor	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	13	9	36	25	55	48	273	10	15	247	21
Total Analysis Volume [veh/h]	57	52	37	143	102	219	191	1091	39	59	987	83
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	26.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	5	0	4	5	0	4	6	0	4	6	0
Maximum Green [s]	37	58	0	37	58	0	20	0	0	75	0	0
Amber [s]	3.0	4.3	0.0	3.0	4.3	0.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0
Split [s]	9	32	0	14	37	0	16	36	0	8	28	0
Vehicle Extension [s]	1.5	2.0	0.0	1.5	2.0	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Walk [s]	0	5	0	0	5	0	0	10	0	0	10	0
Pedestrian Clearance [s]	0	21	0	0	16	0	0	13	0	0	12	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	1.5	3.3	0.0	1.5	3.3	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	no		no	no		no	yes		no	yes	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	L	C	R	L	C	C
L, Total Lost Time per Cycle [s]	3.50	5.30	5.30	3.50	5.30	3.50	6.00	6.00	3.50	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.50	3.30	3.30	1.50	3.30	1.50	4.00	4.00	1.50	4.00	4.00
g_i, Effective Green Time [s]	4	14	14	9	19	11	45	45	4	37	37
g / C, Green / Cycle	0.04	0.16	0.16	0.10	0.21	0.13	0.50	0.50	0.04	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.03	0.03	0.02	0.08	0.19	0.11	0.31	0.02	0.03	0.21	0.21
s, saturation flow rate [veh/h]	1774	1863	1598	1774	1663	1774	3547	1583	1774	1863	1792
c, Capacity [veh/h]	74	292	251	176	357	226	1763	787	77	770	741
d1, Uniform Delay [s]	42.74	32.89	32.82	39.76	34.44	38.45	16.45	11.68	42.63	19.56	19.57
k, delay calibration	0.04	0.04	0.04	0.14	0.04	0.22	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.18	0.10	0.11	10.76	3.39	15.58	1.64	0.12	5.76	2.34	2.43
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.77	0.17	0.16	0.81	0.90	0.85	0.62	0.05	0.76	0.50	0.50
d, Delay for Lane Group [s/veh]	48.93	32.99	32.93	50.52	37.83	54.03	18.09	11.80	48.40	21.90	22.00
Lane Group LOS	D	C	C	D	D	D	B	B	D	C	C
Critical Lane Group	yes	no	no	no	yes	no	yes	no	yes	no	no
50th-Percentile Queue Length [veh]	1.33	0.90	0.72	3.48	6.74	4.89	7.48	0.39	1.34	5.69	5.50
50th-Percentile Queue Length [ft]	33.23	22.55	17.88	86.93	168.42	122.20	187.05	9.63	33.47	142.36	137.62
95th-Percentile Queue Length [veh]	2.39	1.62	1.29	6.26	10.99	8.51	11.97	0.69	2.41	9.61	9.35
95th-Percentile Queue Length [ft]	59.81	40.58	32.18	156.48	274.84	212.84	299.20	17.34	60.25	240.20	233.82

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	48.93	32.99	32.93	50.52	37.83	37.83	54.03	18.09	11.80	48.40	21.94	22.00
Movement LOS	D	C	C	D	D	D	D	B	B	D	C	C
d_A, Approach Delay [s/veh]	39.19			41.74			23.10			23.86		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	27.33											
Intersection LOS	C											
Intersection V/C	0.566											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX 6.2:

EAP (2016) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM	TRAFFIC CONDITIONS		EAP (2016)
				CALC DL	DATE	06/03/14
Jurisdiction: City of Jurupa Valley				CHK DL	DATE	06/03/14
Major Street: Pats Ranch Road				Critical Approach Speed (Major)		35 mph
Minor Street: Driveway 1				Critical Approach Speed (Minor)		25 mph

Major Street Approach Lanes = **2** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **8,793** vpd Minor Street Future ADT = **607** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN / RURAL	Number of lanes for moving traffic on each approach		Minimum Requirements EADT			
			Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
	Major Street	Minor Street	Urban	Rural	Urban	Rural
CONDITION A - Minimum Vehicular Volume						
Satisfied / Not Satisfied XX						
	1	*1*	8,000	5,600	2,400	1,680
	2 + **8,793**	*1* **607**	9,600	6,720	2,400	1,680
	2 +	*2* +	9,600	6,720	3,200	2,240
	1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic						
Satisfied / Not Satisfied XX						
	1	*1*	12,000	8,400	1,200	850
	2 + **8,793**	*1* **607**	14,400	10,080	1,200	850
	2 +	*2* +	14,400	10,080	1,600	1,120
	1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B						
Satisfied / Not Satisfied XX			2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 25%	**B** 51%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		EAP (2016)
				CALC	DL	DATE	06/03/14
Jurisdiction:	City of Jurupa Valley			CHK	DL	DATE	06/03/14
Major Street:	Pats Ranch Road				Critical Approach Speed (Major)		35 mph
Minor Street:	Ivory Street				Critical Approach Speed (Minor)		25 mph

Major Street Approach Lanes = **2** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **8,111** vpd Minor Street Future ADT = **713** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied XX	Urban	Rural	Urban	Rural
Number of lanes for moving traffic on each approach					
Major Street	Minor Street				
1	1	8,000	5,600	2,400	1,680
2 + **8,111**	1 **713**	9,600	6,720	2,400	1,680
2 +	2 +	9,600	6,720	3,200	2,240
1	2 +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied XX	Urban	Rural	Urban	Rural
Number of lanes for moving traffic on each approach					
Major Street	Minor Street				
1	1	12,000	8,400	1,200	850
2 + **8,111**	1 **713**	14,400	10,080	1,200	850
2 +	2 +	14,400	10,080	1,600	1,120
1	2 +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	A 30% B 56%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

APPENDIX 6.3:

EAP (2016) CONDITIONS QUEUING ANALYSIS WORKSHEETS

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Intersection: 9: Pats Ranch Rd. & Limonite Av.

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	R	L	T	T	L	L	R
Maximum Queue (ft)	205	227	77	166	398	382	232	410	330
Average Queue (ft)	106	122	31	81	179	150	133	190	60
95th Queue (ft)	191	206	62	210	603	546	282	495	325
Link Distance (ft)	1017	1017			790	790		718	718
Upstream Blk Time (%)					2	1		5	3
Queuing Penalty (veh)					9	3		0	0
Storage Bay Dist (ft)			200	165			200		
Storage Blk Time (%)		1			23		16	10	
Queuing Penalty (veh)		1			14		34	20	

Intersection: 12: Wineville Av. & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	T	TR	L	TR
Maximum Queue (ft)	106	137	158	41	187	428	422	100	82	77	112	183
Average Queue (ft)	40	48	71	12	30	224	203	42	31	20	39	85
95th Queue (ft)	86	109	132	35	113	374	364	83	67	49	85	160
Link Distance (ft)		790	790			2416	2416		1217	1217		598
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	250			360	250			185			100	
Storage Blk Time (%)						8					1	5
Queuing Penalty (veh)						2					3	2

Intersection: 33: I-15 SB Ramps & Limonite Av.

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	889	822	298	283	273	131	93	204	281	249
Average Queue (ft)	467	299	122	182	181	15	11	69	183	140
95th Queue (ft)	777	644	232	254	256	72	54	172	261	236
Link Distance (ft)	1150	1150				649	649		1306	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)			150	275	275			400		400
Storage Blk Time (%)		3	4	0	0					
Queuing Penalty (veh)		15	21	0	1					

Intersection: 34: I-15 NB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	275	310	140	176	916	596	325	233	284	244
Average Queue (ft)	147	164	36	61	620	264	116	106	168	95
95th Queue (ft)	263	285	105	133	898	536	250	222	262	219
Link Distance (ft)			649	649	1017	1017			1256	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300	300					150	450		450
Storage Blk Time (%)		0				17	2			
Queuing Penalty (veh)		1				61	12			

Network Summary

Network wide Queuing Penalty: 119

Intersection: 9: Pats Ranch Rd. & Limonite Av.

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	R	L	T	T	L	L	R
Maximum Queue (ft)	296	302	257	245	329	158	195	222	148
Average Queue (ft)	173	176	65	166	67	35	87	124	61
95th Queue (ft)	279	275	156	249	227	112	158	198	114
Link Distance (ft)	1017	1017			790	790		718	718
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			200	165			200		
Storage Blk Time (%)		5		8	0		0	1	
Queuing Penalty (veh)		16		36	0		0	2	

Intersection: 12: Wineville Av. & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	T	TR	L	TR
Maximum Queue (ft)	228	218	238	58	350	577	533	107	55	67	164	466
Average Queue (ft)	112	115	130	16	100	363	332	40	18	16	115	191
95th Queue (ft)	208	197	208	43	295	583	548	83	46	44	188	385
Link Distance (ft)		790	790			2416	2416		1217	1217		598
Upstream Blk Time (%)												0
Queuing Penalty (veh)												0
Storage Bay Dist (ft)	250			360	250			185			100	
Storage Blk Time (%)	0	0				35					30	17
Queuing Penalty (veh)	1	0				19					90	23

Intersection: 33: I-15 SB Ramps & Limonite Av.

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	504	416	281	229	253	162	169	234	308	288
Average Queue (ft)	295	224	108	110	114	55	40	138	229	184
95th Queue (ft)	442	368	214	195	206	134	117	229	295	261
Link Distance (ft)	1150	1150				649	649		1306	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)			150	275	275			400		400
Storage Blk Time (%)		11	3		0					
Queuing Penalty (veh)		48	16		0					

Intersection: 34: I-15 NB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	228	233	232	258	361	314	189	311	379	348
Average Queue (ft)	92	107	100	126	202	163	56	200	266	214
95th Queue (ft)	182	194	206	239	319	269	127	304	355	307
Link Distance (ft)			649	649	1017	1017			1256	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	300	300					150	450		450
Storage Blk Time (%)						11	0			
Queuing Penalty (veh)						28	1			

Network Summary

Network wide Queuing Penalty: 281

APPENDIX 6.4:

EAP (2016) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Option 1: AM Improvements

Number	93					
Intersection	Pats Ranch Road / 68th Street					
Control Type	Signalized					
Analysis Method	HCM 2010					
Name	Pats Ranch Road		68th Street		68th Street	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Base Volume Input [veh/h]	25	193	250	407	379	35
Total Analysis Volume [veh/h]	46	326	365	572	533	51

Intersection Settings

Cycle Length [s]	100					
Coordination Type	Time of Day Pattern Coordinated					
Actuation Type	Fixed time					
Lost time [s]	0.00					
Control Type	Permissive	Overlap	Protected	Permissive	Permissive	Permissive
Signal Group	5	3	3	8	4	0
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	10	10	10	10	10	0
Maximum Green [s]	0	0	0	0	0	0
Amber [s]	5.0	3.0	3.0	5.0	5.0	0.0
All red [s]	2.0	1.0	1.0	2.0	2.0	0.0
Split [s]	27	38	38	73	35	0
Walk [s]	7	0	0	7	7	0
Pedestrian Clearance [s]	20	0	0	20	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	no	no	no	no	no	
Maximum Recall	no	no	no	yes	yes	
Pedestrian Recall	no	no	no	no	no	

Lane Group Calculations

g / C, Green / Cycle	0.20	0.61	0.34	0.66	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.03	0.23	0.23	0.34	0.17	0.04
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900
Arrival type	3		3		3	
s, saturation flow rate [veh/h]	1597	1425	1597	1676	3192	1425
c, Capacity [veh/h]	319	869	543	1106	894	399
X, volume / capacity	0.14	0.38	0.67	0.52	0.60	0.13
d, Delay for Lane Group [s/veh]	33.90	11.10	34.75	10.50	34.04	27.54
Lane Group LOS	C	B	C	B	C	C
Critical Lane Group	no	yes	no	no	yes	no
50th-Percentile Queue Length [veh]	0.99	3.56	7.97	5.64	5.62	0.94
50th-Percentile Queue Length [ft]	24.73	89.08	199.26	140.89	140.53	23.56
95th-Percentile Queue Length [veh]	1.78	6.41	12.60	9.53	9.51	1.70
95th-Percentile Queue Length [ft]	44.51	160.34	315.02	238.22	237.74	42.41

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	33.90	11.10	34.75	10.50	34.04	27.54
Movement LOS	C	B	C	B	C	C
Critical Movement	no	no	yes	no	no	no
d_A, Approach Delay [s/veh]	13.92		19.95		33.48	
Approach LOS	B		B		C	
d_I, Intersection Delay [s/veh]	22.94					
Intersection LOS	C					
Intersection V/C	0.396					

Option 1: Mid-Day Improvements

Number	93					
Intersection	Pats Ranch Road / 68th Street					
Control Type	Signalized					
Analysis Method	HCM 2010					
Name	Pats Ranch Road		68th Street		68th Street	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Base Volume Input [veh/h]	28	231	187	253	307	41
Total Analysis Volume [veh/h]	49	386	345	388	471	75

Intersection Settings

Cycle Length [s]	95					
Coordination Type	Time of Day Pattern Coordinated					
Actuation Type	Fixed time					
Lost time [s]	0.00					
Control Type	Permissive	Overlap	Protected	Permissive	Permissive	Permissive
Signal Group	5	3	3	8	4	0
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	10	10	10	10	10	0
Maximum Green [s]	0	0	0	0	0	0
Amber [s]	5.0	3.0	3.0	5.0	5.0	0.0
All red [s]	2.0	1.0	1.0	2.0	2.0	0.0
Split [s]	27	34	34	68	34	0
Walk [s]	7	0	0	7	7	0
Pedestrian Clearance [s]	20	0	0	20	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	no	no	no	no	no	
Maximum Recall	no	no	no	yes	yes	
Pedestrian Recall	no	no	no	no	no	

Lane Group Calculations

g / C, Green / Cycle	0.21	0.60	0.32	0.64	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.03	0.27	0.22	0.23	0.15	0.05
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900
Arrival type	3		3		3	
s, saturation flow rate [veh/h]	1597	1425	1597	1676	3192	1425
c, Capacity [veh/h]	336	855	504	1076	907	405
X, volume / capacity	0.15	0.45	0.68	0.36	0.52	0.19
d, Delay for Lane Group [s/veh]	31.45	12.14	35.72	8.86	30.67	26.70
Lane Group LOS	C	B	D	A	C	C
Critical Lane Group	no	yes	no	no	yes	no
50th-Percentile Queue Length [veh]	0.98	4.35	7.41	3.25	4.50	1.33
50th-Percentile Queue Length [ft]	24.53	108.75	185.18	81.22	112.52	33.16
95th-Percentile Queue Length [veh]	1.77	7.77	11.87	5.85	7.98	2.39
95th-Percentile Queue Length [ft]	44.15	194.26	296.77	146.20	199.50	59.69

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	31.45	12.14	35.72	8.86	30.67	26.70
Movement LOS	C	B	D	A	C	C
Critical Movement	no	no	yes	no	no	no
d_A, Approach Delay [s/veh]	14.32		21.50		30.13	
Approach LOS	B		C		C	
d_I, Intersection Delay [s/veh]	22.43					
Intersection LOS	C					
Intersection V/C	0.418					

Option 1: PM Improvements

Number	93					
Intersection	Pats Ranch Road / 68th Street					
Control Type	Signalized					
Analysis Method	HCM 2010					
Name	Pats Ranch Road		68th Street		68th Street	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Base Volume Input [veh/h]	30	233	189	232	209	16
Total Analysis Volume [veh/h]	41	311	279	284	256	29

Intersection Settings

Cycle Length [s]	110					
Coordination Type	Time of Day Pattern Coordinated					
Actuation Type	Fixed time					
Lost time [s]	0.00					
Control Type	Permissive	Overlap	Protected	Permissive	Permissive	Permissive
Signal Group	5	3	3	8	4	0
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	10	10	10	10	10	0
Maximum Green [s]	0	0	0	0	0	0
Amber [s]	5.0	3.0	3.0	5.0	5.0	0.0
All red [s]	2.0	1.0	1.0	2.0	2.0	0.0
Split [s]	33	41	41	77	36	0
Walk [s]	7	0	0	7	7	0
Pedestrian Clearance [s]	20	0	0	20	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	no	no	no	no	no	
Maximum Recall	no	no	no	yes	yes	
Pedestrian Recall	no	no	no	no	no	

Lane Group Calculations

g / C, Green / Cycle	0.24	0.64	0.34	0.64	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.03	0.22	0.17	0.17	0.08	0.02
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900
Arrival type	3		3		3	
s, saturation flow rate [veh/h]	1597	1425	1597	1676	3192	1425
c, Capacity [veh/h]	377	907	537	1067	842	376
X, volume / capacity	0.11	0.34	0.52	0.27	0.30	0.08
d, Delay for Lane Group [s/veh]	33.50	10.34	32.92	9.37	33.36	30.84
Lane Group LOS	C	B	C	A	C	C
Critical Lane Group	no	yes	no	no	yes	no
50th-Percentile Queue Length [veh]	0.91	3.44	6.18	2.76	2.74	0.60
50th-Percentile Queue Length [ft]	22.80	86.07	154.55	69.03	68.60	15.06
95th-Percentile Queue Length [veh]	1.64	6.20	10.26	4.97	4.94	1.08
95th-Percentile Queue Length [ft]	41.03	154.93	256.49	124.25	123.48	27.10

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	33.50	10.34	32.92	9.37	33.36	30.84
Movement LOS	C	B	C	A	C	C
Critical Movement	yes	no	no	no	no	no
d_A, Approach Delay [s/veh]	13.03		21.04		33.10	
Approach LOS	B		C		C	
d_I, Intersection Delay [s/veh]	21.55					
Intersection LOS	C					
Intersection V/C	0.298					

APPENDIX 7.1:

EAPC (2016) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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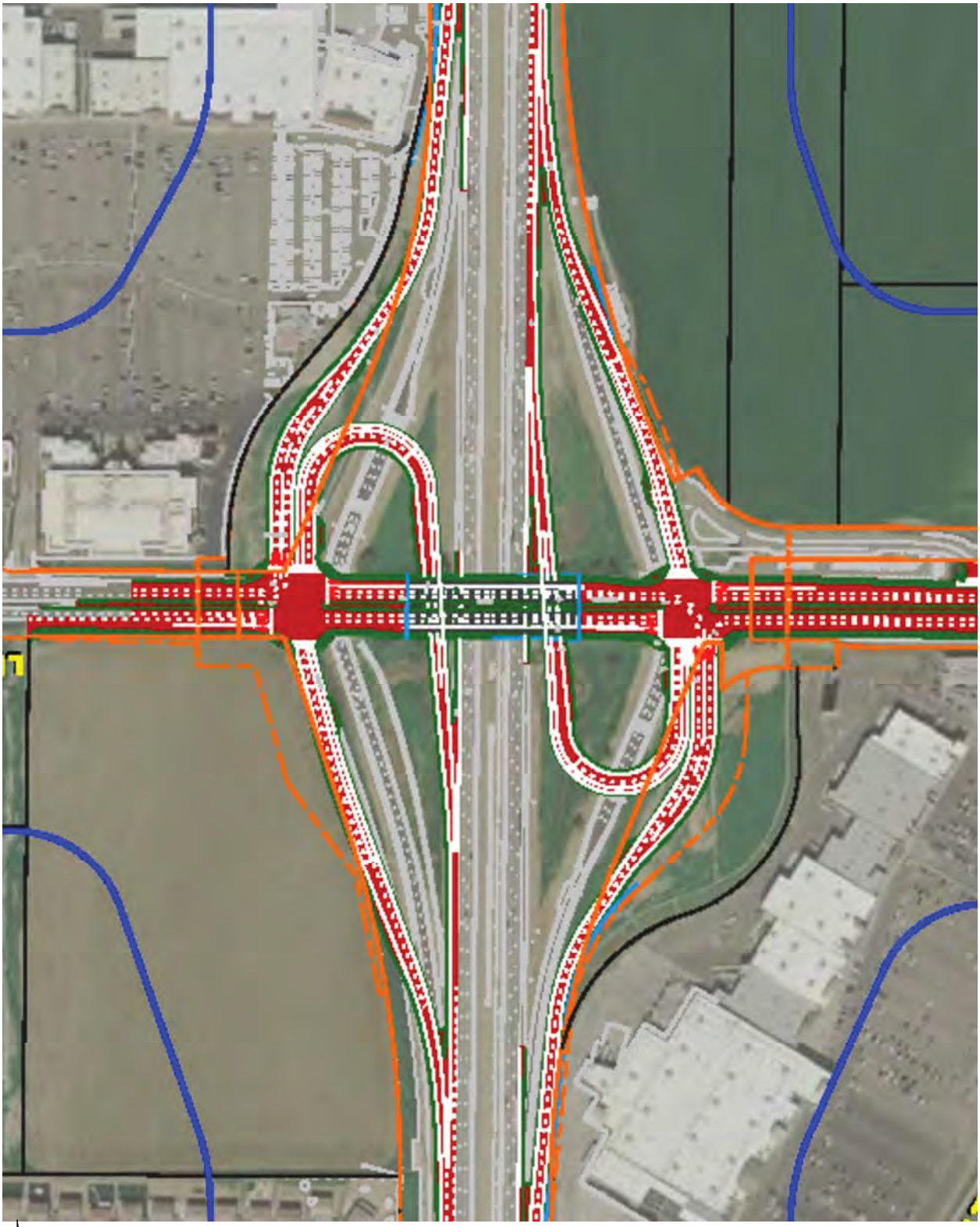
EXHIBIT 7.1-1: I-15 FREEWAY AND LIMONITE AVENUE INTERCHANGE IMPROVEMENTS



NOTE: ALTERNATIVE 3

Intersection Level Of Service Report
#86: Hamner Avenue / 68th Street

Control Type:	Signalized	Delay (sec / veh):	46.9
Analysis Method:	HCM2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.604

Intersection Setup

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	280.00	100.00	100.00	250.00	100.00	100.00	200.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Base Volume Input [veh/h]	45	646	151	51	497	38	108	175	76	223	170	78
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	50	4	4	77	0	0	2	0	16	8	16
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	2	35	16	20	40	9	25	0	3	42	0	55
Right-Turn on Red Volume [veh/h]	0	0	62	0	0	18	0	0	18	0	0	32
Total Hourly Volume [veh/h]	49	757	115	77	634	31	137	184	64	290	185	120
Peak Hour Factor	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790	0.8790
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	215	33	22	180	9	39	52	18	82	53	34
Total Analysis Volume [veh/h]	56	861	131	88	721	35	156	209	73	330	210	137
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0
All red [s]	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Split [s]	12	34	0	12	34	0	23	34	0	25	36	0
Vehicle Extension [s]	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	L	C	R
L, Total Lost Time per Cycle [s]	5.00	7.00	7.00	5.00	7.00	7.00	5.00	7.00	5.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	5.00	5.00	3.00	5.00	5.00	3.00	5.00	3.00	5.00	5.00
g_i, Effective Green Time [s]	6	33	33	7	35	35	12	21	20	29	29
g / C, Green / Cycle	0.05	0.31	0.31	0.07	0.33	0.33	0.11	0.20	0.19	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.04	0.17	0.17	0.06	0.13	0.13	0.10	0.18	0.21	0.13	0.10
s, saturation flow rate [veh/h]	1597	3192	1537	1597	3192	1630	1597	1603	1597	1676	1425
c, Capacity [veh/h]	86	1006	484	108	1051	537	182	319	303	460	391
d1, Uniform Delay [s]	48.73	29.50	29.54	48.27	27.17	27.19	45.67	40.87	42.55	31.59	30.58
k, delay calibration	0.04	0.50	0.50	0.04	0.50	0.50	0.04	0.27	0.45	0.23	0.23
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.12	1.96	4.08	5.40	1.13	2.22	4.43	17.45	75.50	1.51	1.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

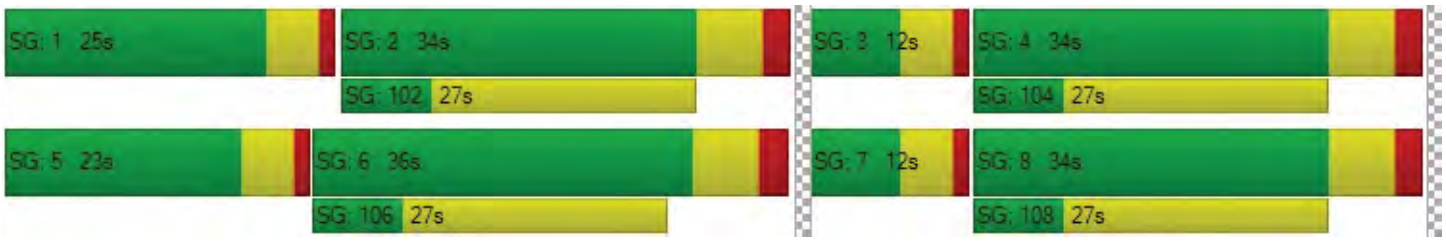
X, volume / capacity	0.65	0.52	0.53	0.81	0.40	0.40	0.86	0.88	1.09	0.46	0.35
d, Delay for Lane Group [s/veh]	51.84	31.46	33.62	53.67	28.30	29.41	50.10	58.32	118.05	33.10	31.72
Lane Group LOS	D	C	C	D	C	C	D	E	F	C	C
Critical Lane Group	no	no	yes	yes	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	1.47	5.46	5.59	2.36	4.02	4.29	4.08	8.32	13.83	4.41	2.79
50th-Percentile Queue Length [ft]	36.73	136.53	139.66	59.06	100.44	107.18	101.88	208.05	345.81	110.37	69.74
95th-Percentile Queue Length [veh]	2.64	9.29	9.46	4.25	7.23	7.68	7.34	13.05	20.83	7.86	5.02
95th-Percentile Queue Length [ft]	66.11	232.35	236.56	106.31	180.79	192.07	183.38	326.32	520.72	196.52	125.54

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.84	31.87	33.62	53.67	28.63	29.41	50.10	58.32	58.32	118.05	33.10	31.72
Movement LOS	D	C	C	D	C	C	D	E	E	F	C	C
d_A, Approach Delay [s/veh]	33.47			31.73			55.40			74.23		
Approach LOS	C			C			E			E		
d_I, Intersection Delay [s/veh]	46.91											
Intersection LOS	D											
Intersection V/C	0.604											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1437	680	659	1134	0	0	0	0	142	0	609
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0.0	182.7	182.7	184.5	175.9	0.0				179.2	182.5	182.7
Adj Flow Rate, veh/h	0	1481	701	679	1169	0				97	0	680
Adj No. of Lanes	0	2	1	2	2	0				1	0	2
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	4	4	3	8	0				6	0	4
Cap, veh/h	0	1426	638	769	2264	0				380	0	687
Arrive On Green	0.00	0.41	0.41	0.07	0.22	0.00				0.22	0.00	0.22
Sat Flow, veh/h	0	3563	1553	3408	3431	0				1707	0	3085
Grp Volume(v), veh/h	0	1481	701	679	1169	0				97	0	680
Grp Sat Flow(s),veh/h/ln	0	1736	1553	1704	1671	0				1707	0	1542
Q Serve(g_s), s	0.0	45.2	45.2	21.7	33.8	0.0				5.2	0.0	24.2
Cycle Q Clear(g_c), s	0.0	45.2	45.2	21.7	33.8	0.0				5.2	0.0	24.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1426	638	769	2264	0				380	0	687
V/C Ratio(X)	0.00	1.04	1.10	0.88	0.52	0.00				0.26	0.00	0.99
Avail Cap(c_a), veh/h	0	1426	638	1100	2264	0				380	0	687
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	32.4	32.4	49.5	26.9	0.0				35.2	0.0	42.6
Incr Delay (d2), s/veh	0.0	34.4	65.7	0.5	0.1	0.0				0.1	0.0	31.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	28.4	31.0	10.3	15.7	0.0				2.4	0.0	13.3
LnGrp Delay(d),s/veh	0.0	66.8	98.1	49.9	27.0	0.0				35.4	0.0	74.2
LnGrp LOS		F	F	D	C					D		E
Approach Vol, veh/h		2182			1848						777	
Approach Delay, s/veh		76.9			35.4						69.4	
Approach LOS		E			D						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	29.3	50.7		30.0		80.0		
Change Period (Y+Rc), s	4.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	35.5	34.5		24.5		74.5		
Max Q Clear Time (g_c+I1), s	23.7	47.2		26.2		35.8		
Green Ext Time (p_c), s	1.1	0.0		0.0		21.5		

Intersection Summary	
HCM 2010 Ctrl Delay	59.7
HCM 2010 LOS	E

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	841	739	0	0	1353	393	440	2	302	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	182.7	179.2	0.0	0.0	181.0	182.7	174.3	176.2	181.0			
Adj Flow Rate, veh/h	904	795	0	0	1455	423	575	0	217			
Adj No. of Lanes	2	2	0	0	2	1	2	0	1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	4	6	0	0	5	4	9	0	5			
Cap, veh/h	987	2307	0	0	1182	532	740	0	343			
Arrive On Green	0.29	0.68	0.00	0.00	0.34	0.34	0.22	0.00	0.22			
Sat Flow, veh/h	3375	3495	0	0	3529	1546	3320	0	1538			
Grp Volume(v), veh/h	904	795	0	0	1455	423	575	0	217			
Grp Sat Flow(s),veh/h/ln	1688	1703	0	0	1719	1546	1660	0	1538			
Q Serve(g_s), s	28.5	10.8	0.0	0.0	37.8	27.2	17.9	0.0	14.0			
Cycle Q Clear(g_c), s	28.5	10.8	0.0	0.0	37.8	27.2	17.9	0.0	14.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	987	2307	0	0	1182	532	740	0	343			
V/C Ratio(X)	0.92	0.34	0.00	0.00	1.23	0.80	0.78	0.00	0.63			
Avail Cap(c_a), veh/h	1089	2307	0	0	1182	532	740	0	343			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.20	0.20	0.00	0.00	0.77	0.77	1.00	0.00	1.00			
Uniform Delay (d), s/veh	37.6	7.5	0.0	0.0	36.1	32.6	40.2	0.0	38.7			
Incr Delay (d2), s/veh	2.7	0.1	0.0	0.0	109.8	9.3	7.9	0.0	8.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	13.7	5.1	0.0	0.0	35.9	13.0	9.0	0.0	6.8			
LnGrp Delay(d),s/veh	40.3	7.6	0.0	0.0	145.9	41.9	48.1	0.0	47.3			
LnGrp LOS	D	A			F	D	D		D			
Approach Vol, veh/h		1699			1878			792				
Approach Delay, s/veh		25.0			122.5			47.9				
Approach LOS		C			F			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		80.0			36.7	43.3		30.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.5
Max Green Setting (Gmax), s		74.5			35.5	34.5		24.5
Max Q Clear Time (g_c+I1), s		12.8			30.5	39.8		19.9
Green Ext Time (p_c), s		17.5			1.7	0.0		1.4

Intersection Summary	
HCM 2010 Ctrl Delay	71.0
HCM 2010 LOS	E

Notes

User approved volume balancing among the lanes for turning movement.

Intersection Level Of Service Report
#89: Pats Ranch Road / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	26.2
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.626

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	170.00	100.00	100.00
Speed [mph]	35.00			50.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			no			no			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Limonite Avenue			Limonite Avenue		
Base Volume Input [veh/h]	328	0	49	0	0	0	0	600	90	55	933	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	85	0	24	0	0	0	0	57	20	6	64	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	138	0	15	6	1	11	4	160	54	134	137	2
Right-Turn on Red Volume [veh/h]	0	0	35	0	0	0	0	0	42	0	0	0
Total Hourly Volume [veh/h]	564	0	55	6	1	11	4	841	126	197	1171	2
Peak Hour Factor	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	153	0	15	2	0	3	1	228	34	53	318	1
Total Analysis Volume [veh/h]	612	0	60	7	1	12	4	913	137	214	1271	2
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	6	0	5	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.2	4.7	0.0	3.2	4.7	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	31	31	0	9	9	0	10	30	0	20	40	0
Vehicle Extension [s]	2.5	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	1.5	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	11	0	0	0	0
Pedestrian Clearance [s]	0	20	0	0	0	0	0	13	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.2	3.7	0.0	2.2	3.7	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	no		no	no		no	yes		no	yes	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.20	5.70	5.70	4.20	5.70	5.70
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.20	3.70	3.70	2.20	3.70	3.70
g_i, Effective Green Time [s]	20	21	21	1	1	1	37	37	14	50	50
g / C, Green / Cycle	0.22	0.23	0.23	0.01	0.02	0.01	0.41	0.41	0.15	0.56	0.56
(v / s)_i Volume / Saturation Flow Rate	0.20	0.00	0.04	0.00	0.01	0.00	0.29	0.10	0.13	0.40	0.00
s, saturation flow rate [veh/h]	3101	1676	1425	1597	1442	1597	3192	1425	1597	3192	1425
c, Capacity [veh/h]	696	387	329	15	23	10	1299	580	245	1771	790
d1, Uniform Delay [s]	33.75	0.00	27.81	44.38	44.00	44.62	22.18	17.52	37.27	14.84	8.95
k, delay calibration	0.08	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.20	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.86	0.00	0.26	19.68	19.33	26.84	3.20	0.96	15.58	2.54	0.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

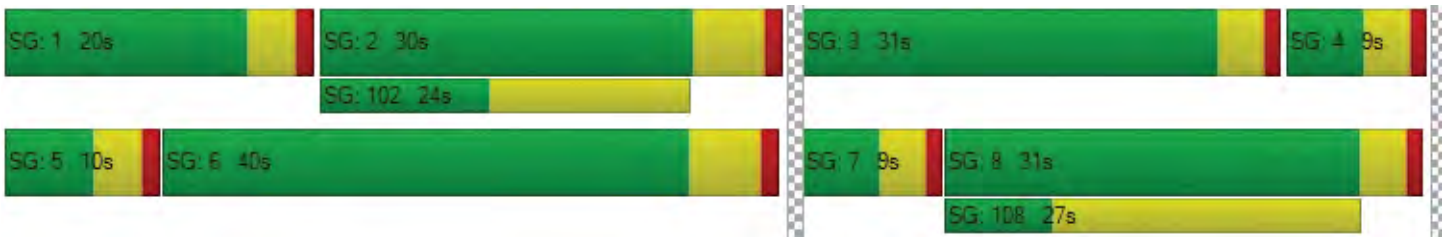
X, volume / capacity	0.88	0.00	0.18	0.46	0.56	0.42	0.70	0.24	0.87	0.72	0.00
d, Delay for Lane Group [s/veh]	36.61	0.00	28.07	64.06	63.34	71.46	25.38	18.48	52.85	17.38	8.95
Lane Group LOS	D	A	C	E	E	E	C	B	D	B	A
Critical Lane Group	yes	no	no	no	yes	no	yes	no	yes	no	no
50th-Percentile Queue Length [veh]	6.49	0.00	1.03	0.23	0.40	0.16	7.77	1.86	5.41	8.60	0.02
50th-Percentile Queue Length [ft]	162.22	0.00	25.86	5.79	9.95	3.91	194.15	46.46	135.36	214.92	0.41
95th-Percentile Queue Length [veh]	10.67	0.00	1.86	0.42	0.72	0.28	12.34	3.35	9.23	13.41	0.03
95th-Percentile Queue Length [ft]	266.66	0.00	46.55	10.42	17.91	7.04	308.41	83.63	230.77	335.14	0.74

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	36.61	0.00	28.07	64.06	63.34	63.34	71.46	25.38	18.48	52.85	17.38	8.95
Movement LOS	D	A	C	E	E	E	E	C	B	D	B	A
d_A, Approach Delay [s/veh]	35.85			63.59			24.66			22.47		
Approach LOS	D			E			C			C		
d_I, Intersection Delay [s/veh]	26.22											
Intersection LOS	C											
Intersection V/C	0.626											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
#90: Pats Ranch Road / 65th Street

Control Type:	Signalized	Delay (sec / veh):	10.0
Analysis Method:	HCM2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.221

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	90.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Base Volume Input [veh/h]	44	246	30	7	119	0	19	5	19	41	6	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	114	0	0	28	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	122	0	0	42	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	3	0	0	0	0	0	16	0	0	24
Total Hourly Volume [veh/h]	46	492	28	7	194	0	20	5	4	43	6	10
Peak Hour Factor	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	149	8	2	59	0	6	2	1	13	2	3
Total Analysis Volume [veh/h]	56	597	34	8	235	0	24	6	5	52	7	12
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	0	1	6	0	0	4	0	0	8	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.6	3.6	0.0	3.6	3.6	0.0	0.0	3.6	0.0	0.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	16	27	0	16	27	0	0	27	0	0	27	0
Vehicle Extension [s]	2.5	2.5	0.0	2.5	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	15	0	0	15	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.6	2.6	0.0	2.6	2.6	0.0	0.0	2.6	0.0	0.0	2.6	0.0
Minimum Recall	no	no		no	no			no			no	
Maximum Recall	no	yes		no	yes			no			no	
Pedestrian Recall	no	no		no	no			no			no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	5	50	50	1	46	46	6	6	6	6
g / C, Green / Cycle	0.07	0.71	0.71	0.01	0.66	0.66	0.08	0.08	0.08	0.08
(v / s)_i Volume / Saturation Flow Rate	0.04	0.14	0.14	0.01	0.07	0.00	0.02	0.01	0.08	0.01
s, saturation flow rate [veh/h]	1597	1676	1634	1597	3192	1425	1263	1552	776	1425
c, Capacity [veh/h]	105	1188	1157	23	2096	936	103	124	159	114
d1, Uniform Delay [s]	31.61	3.46	3.46	34.15	4.45	0.00	34.97	29.81	32.97	29.85
k, delay calibration	0.08	0.50	0.50	0.08	0.50	0.50	0.08	0.08	0.08	0.08
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.05	0.37	0.38	6.66	0.11	0.00	0.85	0.23	1.07	0.30
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.53	0.20	0.20	0.35	0.11	0.00	0.23	0.09	0.37	0.11
d, Delay for Lane Group [s/veh]	34.67	3.83	3.84	40.81	4.56	0.00	35.82	30.04	34.03	30.15
Lane Group LOS	C	A	A	D	A	A	D	C	C	C
Critical Lane Group	no	no	yes	yes	no	no	no	no	yes	no
50th-Percentile Queue Length [veh]	0.96	0.82	0.81	0.17	0.48	0.00	0.43	0.18	1.03	0.19
50th-Percentile Queue Length [ft]	24.06	20.54	20.14	4.28	12.12	0.00	10.86	4.41	25.65	4.84
95th-Percentile Queue Length [veh]	1.73	1.48	1.45	0.31	0.87	0.00	0.78	0.32	1.85	0.35
95th-Percentile Queue Length [ft]	43.30	36.96	36.25	7.71	21.82	0.00	19.55	7.94	46.17	8.71

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.67	3.83	3.84	40.81	4.56	0.00	35.82	30.04	30.04	34.03	34.03	30.15
Movement LOS	C	A	A	D	A	A	D	C	C	C	C	C
d_A, Approach Delay [s/veh]	7.16			5.75			34.00			33.38		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	9.99											
Intersection LOS	A											
Intersection V/C	0.221											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

The delay reported in the traffic study is higher than that calculated in this worksheet as the calculated delay is lower than the comparable previous scenario. This is due to the HCM 2010 methodology which reports delay as the average delay of all vehicles at the intersection. The lower delay in this scenario is due to the fact that the added volumes are to movements experiencing lower delays than most.

Intersection Level Of Service Report
#91: Pats Ranch Road / Driveway 1

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.023

Intersection Setup

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	150.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		yes	

Volumes

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Base Volume Input [veh/h]	0	320	179	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	114	14	14	0	18
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	122	42	0	0	0
Total Hourly Volume [veh/h]	0	569	242	14	0	18
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	155	66	4	0	5
Total Analysis Volume [veh/h]	0	618	263	15	0	20
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.00	0.00	0.00	0.02
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	9.17
Movement LOS		A	A	A		A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.07
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	1.74
d_A, Approach Delay [s/veh]	0.00		0.00		9.17	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.20					
Intersection LOS	A					

Intersection Level Of Service Report
#92: Pats Ranch Road / Ivory Street

Control Type:	Two-way stop	Delay (sec / veh):	24.1
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 2			Ivory Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	150.00	100.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 2			Ivory Street		
Base Volume Input [veh/h]	0	237	48	33	146	0	0	0	0	72	0	83
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	12	0	0	0	18	14	114	0	30	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	122	0	0	42	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	368	50	34	212	14	114	0	30	75	0	86
Peak Hour Factor	0.6820	0.6820	0.6820	0.6820	0.6820	0.6820	0.6820	0.6820	0.6820	0.6820	0.6820	0.6820
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	135	18	12	78	5	42	0	11	27	0	32
Total Analysis Volume [veh/h]	18	540	73	50	311	21	167	0	44	110	0	126
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			no	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			yes	yes
Number of Storage Spaces in Median	0	0	2	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.00	0.05	0.00	0.00	0.45	0.00	0.05	0.30	0.00	0.18
d_M, Delay for Movement [s/veh]	7.98	0.00	0.00	8.95	0.00	0.00	23.19	24.08	17.67	19.24	18.98	11.39
Movement LOS	A	A	A	A	A	A	C	C	C	C	C	B
95th-Percentile Queue Length [veh]	0.04	0.00	0.00	0.16	0.00	0.00	2.76	2.76	2.76	1.26	1.26	0.66
95th-Percentile Queue Length [ft]	1.12	0.00	0.00	4.10	0.00	0.00	68.96	68.96	68.96	31.50	31.50	16.62
d_A, Approach Delay [s/veh]	0.23			1.17			22.04			15.05		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	6.02											
Intersection LOS	C											

Intersection Level Of Service Report
#93: Pats Ranch Road / 68th Street

Control Type:	All-way stop	Delay (sec / veh):	87.3
Analysis Method:	HCM2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name				Pats Ranch Road			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	220.00
Speed [mph]	25.00			35.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			yes			no			no		

Volumes

Name				Pats Ranch Road			68th Street			68th Street		
Base Volume Input [veh/h]	0	0	0	25	0	193	250	407	0	0	379	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	8	0	40	10	0	0	0	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	50	82	13	14	28	0	0	7	17	5	19	40
Total Hourly Volume [veh/h]	50	82	13	48	28	241	270	430	17	5	413	78
Peak Hour Factor	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	28	4	16	9	82	91	145	6	2	140	26
Total Analysis Volume [veh/h]	68	111	18	65	38	326	365	582	23	7	559	106
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.68	1.45	0.64	0.33	7.02	9.87	30.46	0.06	5.31	5.31	0.97
95th-Percentile Queue Length [ft]	16.91	36.31	16.05	8.24	175.57	246.80	761.55	1.42	132.8	132.8	24.25
Approach Delay [s/veh]	16.09		32.45			167.01		28.19			
Approach LOS	C		D			F		D			
Intersection Delay [s/veh]	87.32										
Intersection LOS	F										

Intersection Level Of Service Report
#94: Wineville Avenue / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	26.6
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.619

Intersection Setup

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Pocket Length [ft]	185.00	100.00	100.00	100.00	100.00	100.00	250.00	100.00	360.00	245.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Base Volume Input [veh/h]	56	105	46	40	77	120	69	532	48	26	812	29
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	10	0	0	0	0	10	7	67	7	0	50	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	23	3	6	26	1	60	27	150	4	2	189	9
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	24	0	0	0
Total Hourly Volume [veh/h]	91	112	54	68	81	195	106	770	37	29	1083	39
Peak Hour Factor	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	30	14	18	22	52	28	205	10	8	289	10
Total Analysis Volume [veh/h]	97	119	58	72	86	208	113	821	39	31	1155	42
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	80
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	26.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	5	0	4	5	0	4	6	0	4	6	0
Maximum Green [s]	37	58	0	37	58	0	20	0	0	75	0	0
Amber [s]	3.0	4.3	0.0	3.0	4.3	0.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0
Split [s]	11	32	0	11	32	0	9	29	0	8	28	0
Vehicle Extension [s]	1.5	2.0	0.0	1.5	2.0	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Walk [s]	0	5	0	0	5	0	0	10	0	0	10	0
Pedestrian Clearance [s]	0	21	0	0	16	0	0	13	0	0	12	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	1.5	3.3	0.0	1.5	3.3	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	no		no	no		no	yes		no	yes	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	L	C	R	L	C	C
L, Total Lost Time per Cycle [s]	3.50	5.30	5.30	3.50	5.30	3.50	6.00	6.00	3.50	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.50	3.30	3.30	1.50	3.30	1.50	4.00	4.00	1.50	4.00	4.00
g_i, Effective Green Time [s]	6	18	18	4	16	6	38	38	2	35	35
g / C, Green / Cycle	0.07	0.22	0.22	0.05	0.20	0.07	0.47	0.47	0.03	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.05	0.05	0.05	0.04	0.18	0.06	0.23	0.02	0.02	0.32	0.32
s, saturation flow rate [veh/h]	1774	1863	1665	1774	1656	1774	3547	1583	1774	1863	1840
c, Capacity [veh/h]	125	409	365	94	334	122	1679	750	46	802	792
d1, Uniform Delay [s]	36.60	25.66	25.74	37.46	31.04	37.09	14.45	11.38	38.68	19.19	19.19
k, delay calibration	0.04	0.04	0.04	0.04	0.04	0.25	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.82	0.10	0.12	4.88	3.02	41.15	1.02	0.13	6.19	6.39	6.48
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

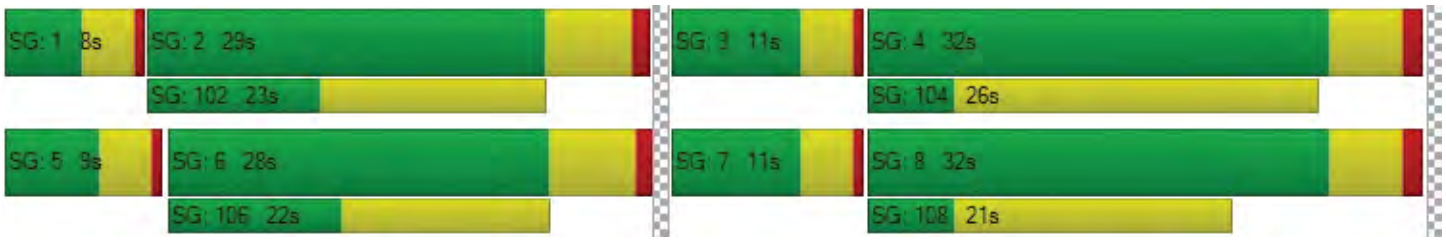
X, volume / capacity	0.78	0.22	0.24	0.77	0.88	0.93	0.49	0.05	0.67	0.75	0.75
d, Delay for Lane Group [s/veh]	40.43	25.76	25.86	42.34	34.07	78.24	15.47	11.52	44.87	25.57	25.68
Lane Group LOS	D	C	C	D	C	E	B	B	D	C	C
Critical Lane Group	yes	no	no	no	yes	yes	no	no	no	no	yes
50th-Percentile Queue Length [veh]	1.89	1.33	1.26	1.44	5.36	3.46	4.57	0.35	0.64	9.09	9.01
50th-Percentile Queue Length [ft]	47.22	33.30	31.61	36.02	133.89	86.62	114.35	8.80	15.90	227.36	225.32
95th-Percentile Queue Length [veh]	3.40	2.40	2.28	2.59	9.15	6.24	8.08	0.63	1.14	14.04	13.94
95th-Percentile Queue Length [ft]	84.99	59.93	56.90	64.84	228.78	155.92	202.03	15.84	28.62	351.00	348.41

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	40.43	25.79	25.86	42.34	34.07	34.07	78.24	15.47	11.52	44.87	25.62	25.68
Movement LOS	D	C	C	D	C	C	E	B	B	D	C	C
d_A, Approach Delay [s/veh]	30.99			35.69			22.60			26.11		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	26.61											
Intersection LOS	C											
Intersection V/C	0.619											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
#86: Hamner Avenue / 68th Street

Control Type:	Signalized	Delay (sec / veh):	35.3
Analysis Method:	HCM2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.532

Intersection Setup

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	280.00	100.00	100.00	250.00	100.00	100.00	200.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Base Volume Input [veh/h]	49	631	182	45	537	71	56	91	38	157	143	72
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	88	16	16	72	0	0	8	0	9	4	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	4	82	49	65	157	30	17	0	11	37	0	37
Right-Turn on Red Volume [veh/h]	0	0	72	0	0	16	0	0	10	0	0	38
Total Hourly Volume [veh/h]	55	826	182	128	787	88	75	103	41	209	153	83
Peak Hour Factor	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850	0.8850
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	233	51	36	222	25	21	29	12	59	43	23
Total Analysis Volume [veh/h]	62	933	206	145	889	99	85	116	46	236	173	94
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0
All red [s]	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Split [s]	12	34	0	12	34	0	17	34	0	20	37	0
Vehicle Extension [s]	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	L	C	R
L, Total Lost Time per Cycle [s]	5.00	7.00	7.00	5.00	7.00	7.00	5.00	7.00	5.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	5.00	5.00	3.00	5.00	5.00	3.00	5.00	3.00	5.00	5.00
g_i, Effective Green Time [s]	6	38	38	11	43	43	7	12	15	21	21
g / C, Green / Cycle	0.06	0.38	0.38	0.11	0.43	0.43	0.07	0.12	0.15	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.04	0.19	0.19	0.09	0.18	0.18	0.05	0.10	0.15	0.10	0.07
s, saturation flow rate [veh/h]	1597	3192	1487	1597	3192	1578	1597	1596	1597	1676	1425
c, Capacity [veh/h]	92	1210	564	171	1369	677	105	199	238	349	296
d1, Uniform Delay [s]	46.20	23.82	23.84	43.82	19.82	19.84	46.09	42.64	42.47	34.96	33.57
k, delay calibration	0.04	0.50	0.50	0.04	0.50	0.50	0.04	0.23	0.34	0.23	0.23
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.21	1.50	3.22	4.37	0.93	1.88	5.54	15.55	45.66	2.33	1.30
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

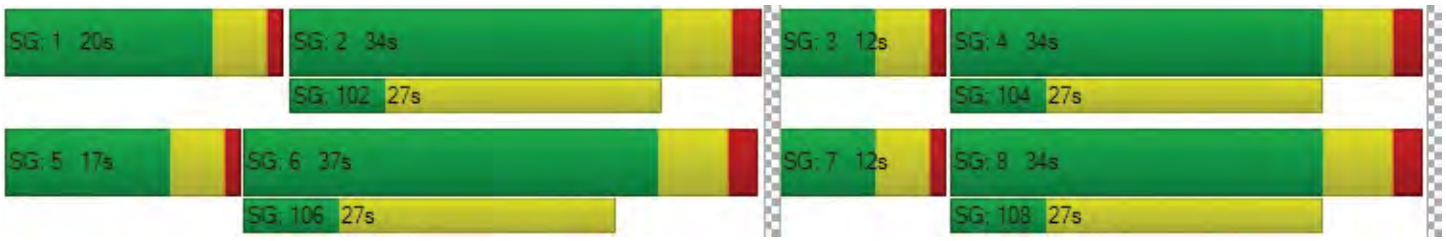
X, volume / capacity	0.68	0.50	0.51	0.85	0.41	0.42	0.81	0.82	0.99	0.50	0.32
d, Delay for Lane Group [s/veh]	49.42	25.33	27.07	48.19	20.75	21.71	51.63	58.19	88.12	37.29	34.87
Lane Group LOS	D	C	C	D	C	C	D	E	F	D	C
Critical Lane Group	no	no	yes	yes	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	1.54	5.42	5.34	3.59	4.42	4.57	2.17	4.60	8.57	3.78	1.96
50th-Percentile Queue Length [ft]	38.51	135.48	133.50	89.82	110.56	114.19	54.27	114.98	214.32	94.46	49.02
95th-Percentile Queue Length [veh]	2.77	9.24	9.13	6.47	7.87	8.07	3.91	8.12	13.37	6.80	3.53
95th-Percentile Queue Length [ft]	69.32	230.93	228.24	161.67	196.78	201.81	97.69	202.91	334.36	170.04	88.23

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	49.42	25.53	27.07	48.19	20.98	21.71	51.63	58.19	58.19	88.12	37.29	34.87
Movement LOS	D	C	C	D	C	C	D	E	E	F	D	C
d_A, Approach Delay [s/veh]	27.41			25.03			55.93			60.69		
Approach LOS	C			C			E			E		
d_I, Intersection Delay [s/veh]	35.34											
Intersection LOS	D											
Intersection V/C	0.532											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
#90: Pats Ranch Road / 65th Street

Control Type:	Signalized	Delay (sec / veh):	9.6
Analysis Method:	HCM2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.313

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	90.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Base Volume Input [veh/h]	50	184	23	34	202	5	22	2	24	18	7	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	59	0	0	112	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	80	0	0	138	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	18	0	0	18
Total Hourly Volume [veh/h]	52	330	24	35	460	5	23	2	7	19	7	4
Peak Hour Factor	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	110	8	12	153	2	8	1	2	6	2	1
Total Analysis Volume [veh/h]	69	438	32	46	611	7	31	3	9	25	9	5
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	0	1	6	0	0	4	0	0	8	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.6	3.6	0.0	3.6	3.6	0.0	0.0	3.6	0.0	0.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	12	27	0	12	27	0	0	31	0	0	31	0
Vehicle Extension [s]	2.5	2.5	0.0	2.5	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	15	0	0	15	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.6	2.6	0.0	2.6	2.6	0.0	0.0	2.6	0.0	0.0	2.6	0.0
Minimum Recall	no	no		no	no			no			no	
Maximum Recall	no	yes		no	yes			no			no	
Pedestrian Recall	no	no		no	no			no			no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	5	48	48	4	47	47	4	4	4	4
g / C, Green / Cycle	0.07	0.69	0.69	0.06	0.68	0.68	0.05	0.05	0.05	0.05
(v / s)_i Volume / Saturation Flow Rate	0.04	0.11	0.11	0.03	0.19	0.00	0.02	0.01	0.08	0.00
s, saturation flow rate [veh/h]	1597	1676	1625	1597	3192	1425	1260	1481	432	1425
c, Capacity [veh/h]	116	1160	1124	93	2161	965	103	77	112	75
d1, Uniform Delay [s]	31.34	3.72	3.73	31.86	4.50	3.66	34.89	31.59	34.30	31.45
k, delay calibration	0.08	0.50	0.50	0.08	0.50	0.50	0.08	0.08	0.08	0.08
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.53	0.29	0.30	3.00	0.33	0.01	1.19	0.68	1.12	0.28
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

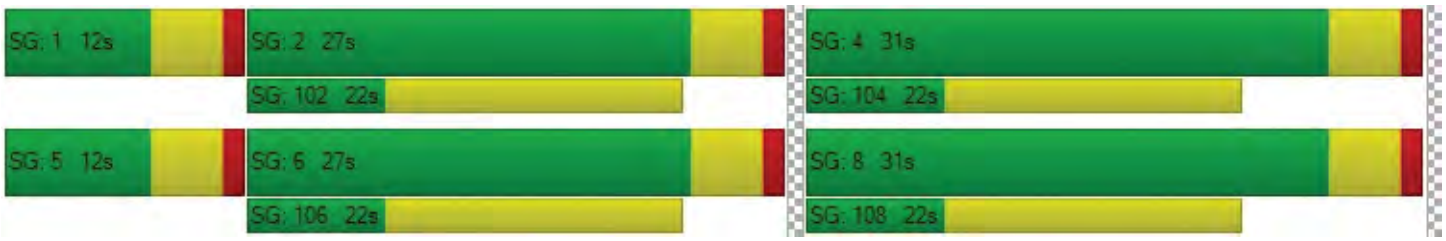
X, volume / capacity	0.59	0.16	0.16	0.49	0.28	0.01	0.30	0.15	0.30	0.07
d, Delay for Lane Group [s/veh]	34.87	4.02	4.03	34.87	4.83	3.67	36.08	32.27	35.41	31.73
Lane Group LOS	C	A	A	C	A	A	D	C	D	C
Critical Lane Group	yes	no	no	no	yes	no	no	no	yes	no
50th-Percentile Queue Length [veh]	1.19	0.69	0.67	0.80	1.30	0.03	0.57	0.21	0.61	0.08
50th-Percentile Queue Length [ft]	29.68	17.20	16.86	19.89	32.40	0.65	14.16	5.13	15.19	2.12
95th-Percentile Queue Length [veh]	2.14	1.24	1.21	1.43	2.33	0.05	1.02	0.37	1.09	0.15
95th-Percentile Queue Length [ft]	53.43	30.96	30.36	35.81	58.31	1.17	25.48	9.23	27.34	3.81

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.87	4.02	4.03	34.87	4.83	3.67	36.08	32.27	32.27	35.41	35.41	31.73
Movement LOS	C	A	A	C	A	A	D	C	C	D	D	C
d_A, Approach Delay [s/veh]	8.95			6.90			35.02			34.94		
Approach LOS	A			A			D			C		
d_I, Intersection Delay [s/veh]	9.61											
Intersection LOS	A											
Intersection V/C	0.313											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



The delay reported in the traffic study is higher than that calculated in this worksheet as the calculated delay is lower than the comparable previous scenario. This is due to the HCM 2010 methodology which reports delay as the average delay of all vehicles at the intersection. The lower delay in this scenario is due to the fact that the added volumes are to movements experiencing lower delays than most.

Intersection Level Of Service Report
#91: Pats Ranch Road / Driveway 1

Control Type:	Two-way stop	Delay (sec / veh):	10.1
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.015

Intersection Setup

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	150.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		yes	

Volumes

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Base Volume Input [veh/h]	0	257	244	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	59	56	56	0	10
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	80	138	0	0	0
Total Hourly Volume [veh/h]	0	406	448	56	0	10
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	110	122	15	0	3
Total Analysis Volume [veh/h]	0	441	487	61	0	11
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.02
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	10.05
Movement LOS		A	A	A		B
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.05
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	1.16
d_A, Approach Delay [s/veh]	0.00		0.00		10.05	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.11					
Intersection LOS	B					

Intersection Level Of Service Report
#92: Pats Ranch Road / Ivory Street

Control Type:	Two-way stop	Delay (sec / veh):	28.7
Analysis Method:	HCM2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.372

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 2			Ivory Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	150.00	100.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 2			Ivory Street		
Base Volume Input [veh/h]	0	165	63	49	195	0	0	0	0	64	0	92
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	48	0	0	0	10	56	59	0	16	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	80	0	0	138	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	48	252	66	51	351	56	59	0	16	67	0	96
Peak Hour Factor	0.6630	0.6630	0.6630	0.6630	0.6630	0.6630	0.6630	0.6630	0.6630	0.6630	0.6630	0.6630
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	95	25	19	132	21	22	0	6	25	0	36
Total Analysis Volume [veh/h]	72	380	100	77	529	84	89	0	24	101	0	145
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			no	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			yes	yes
Number of Storage Spaces in Median	0	0	2	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.00	0.00	0.07	0.01	0.00	0.37	0.00	0.03	0.32	0.00	0.19
d_M, Delay for Movement [s/veh]	9.04	0.00	0.00	8.59	0.00	0.00	28.68	27.43	18.84	21.49	24.85	10.84
Movement LOS	A	A	A	A	A	A	D	D	C	C	C	B
95th-Percentile Queue Length [veh]	0.24	0.00	0.00	0.23	0.00	0.00	1.89	1.89	1.89	1.33	1.33	0.70
95th-Percentile Queue Length [ft]	6.05	0.00	0.00	5.75	0.00	0.00	47.16	47.16	47.16	33.25	33.25	17.49
d_A, Approach Delay [s/veh]	1.18			0.96			26.59			15.21		
Approach LOS	A			A			D			C		
d_I, Intersection Delay [s/veh]	5.03											
Intersection LOS	D											

Intersection Level Of Service Report
#93: Pats Ranch Road / 68th Street

Control Type:	All-way stop	Delay (sec / veh):	47.8
Analysis Method:	HCM2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name				Pats Ranch Road			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	220.00
Speed [mph]	25.00			35.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			yes			no			no		

Volumes

Name				Pats Ranch Road			68th Street			68th Street		
Base Volume Input [veh/h]	0	0	0	28	0	231	187	253	0	0	307	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	4	0	22	40	0	0	0	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	33	54	9	45	93	0	0	23	57	15	17	26
Total Hourly Volume [veh/h]	33	54	9	78	93	262	234	286	57	15	336	77
Peak Hour Factor	0.6780	0.6780	0.6780	0.6780	1.0000	0.6780	0.6780	0.6780	1.0000	1.0000	0.6780	0.6780
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	20	3	29	23	97	86	105	14	4	124	28
Total Analysis Volume [veh/h]	49	80	13	115	93	386	345	422	57	15	496	114
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.43	0.86	1.24	0.88	9.45	8.20	16.59	0.13	4.20	4.20	1.08
95th-Percentile Queue Length [ft]	10.70	21.56	31.08	22.06	236.30	204.99	414.87	3.14	105.0	105.0	27.00
Approach Delay [s/veh]	13.79		37.42			79.22		23.97			
Approach LOS	B		E			F		C			
Intersection Delay [s/veh]	47.80										
Intersection LOS	E										

Intersection Level Of Service Report
#86: Hamner Avenue / 68th Street

Control Type:	Signalized	Delay (sec / veh):	34.6
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.536

Intersection Setup

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	280.00	100.00	100.00	250.00	100.00	100.00	200.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Base Volume Input [veh/h]	69	636	188	96	561	60	56	106	34	161	129	76
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	88	16	16	72	0	0	8	0	9	4	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	4	82	49	65	157	30	17	0	11	37	0	37
Right-Turn on Red Volume [veh/h]	0	0	77	0	0	34	0	0	11	0	0	38
Total Hourly Volume [veh/h]	76	831	184	181	812	58	75	118	35	213	138	87
Peak Hour Factor	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	216	48	47	211	15	19	31	9	55	36	23
Total Analysis Volume [veh/h]	79	863	191	188	843	60	78	123	36	221	143	90
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0
All red [s]	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Split [s]	12	34	0	12	34	0	18	34	0	20	36	0
Vehicle Extension [s]	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	L	C	R
L, Total Lost Time per Cycle [s]	5.00	7.00	7.00	5.00	7.00	7.00	5.00	7.00	5.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	5.00	5.00	3.00	5.00	5.00	3.00	5.00	3.00	5.00	5.00
g_i, Effective Green Time [s]	6	35	35	13	43	43	6	12	15	21	21
g / C, Green / Cycle	0.06	0.35	0.35	0.13	0.43	0.43	0.06	0.12	0.15	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.05	0.18	0.18	0.12	0.17	0.17	0.05	0.10	0.14	0.09	0.06
s, saturation flow rate [veh/h]	1597	3192	1490	1597	3192	1614	1597	1612	1597	1676	1425
c, Capacity [veh/h]	99	1131	528	215	1362	689	99	196	239	351	298
d1, Uniform Delay [s]	46.26	25.42	25.45	42.45	19.80	19.81	46.25	42.79	41.97	34.18	33.37
k, delay calibration	0.04	0.50	0.50	0.04	0.50	0.50	0.04	0.23	0.29	0.23	0.23
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.35	1.63	3.51	4.37	0.87	1.73	5.16	15.43	28.94	1.62	1.20
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

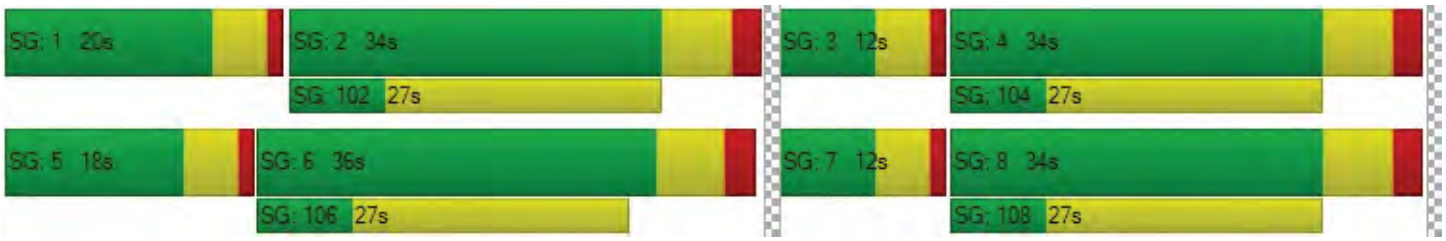
X, volume / capacity	0.80	0.51	0.51	0.88	0.40	0.40	0.79	0.81	0.93	0.41	0.30
d, Delay for Lane Group [s/veh]	51.61	27.05	28.96	46.82	20.68	21.54	51.41	58.22	70.90	35.80	34.57
Lane Group LOS	D	C	C	D	C	C	D	E	E	D	C
Critical Lane Group	no	no	yes	yes	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	2.02	5.30	5.26	4.62	4.21	4.44	1.99	4.51	7.06	3.03	1.87
50th-Percentile Queue Length [ft]	50.40	132.51	131.42	115.53	105.31	110.91	49.65	112.87	176.55	75.84	46.66
95th-Percentile Queue Length [veh]	3.63	9.08	9.02	8.15	7.58	7.89	3.57	8.00	11.42	5.46	3.36
95th-Percentile Queue Length [ft]	90.73	226.91	225.42	203.66	189.46	197.27	89.37	199.99	285.50	136.51	83.99

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.61	27.28	28.96	46.82	20.92	21.54	51.41	58.22	58.22	70.90	35.80	34.57
Movement LOS	D	C	C	D	C	C	D	E	E	E	D	C
d_A, Approach Delay [s/veh]	29.71			25.80			55.98			52.65		
Approach LOS	C			C			E			D		
d_I, Intersection Delay [s/veh]	34.55											
Intersection LOS	C											
Intersection V/C	0.536											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1769	772	468	1589	0	0	0	0	287	1	816
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0.0	186.3	186.3	188.1	186.3	0.0				186.3	186.3	186.3
Adj Flow Rate, veh/h	0	1862	813	493	1673	0				202	0	967
Adj No. of Lanes	0	2	1	2	2	0				1	0	2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	1	2	0				2	0	2
Cap, veh/h	0	1668	746	574	2397	0				395	0	701
Arrive On Green	0.00	0.47	0.47	0.11	0.45	0.00				0.22	0.00	0.22
Sat Flow, veh/h	0	3632	1583	3476	3632	0				1774	0	3145
Grp Volume(v), veh/h	0	1862	813	493	1673	0				202	0	967
Grp Sat Flow(s),veh/h/ln	0	1770	1583	1738	1770	0				1774	0	1573
Q Serve(g_s), s	0.0	51.8	51.8	15.3	41.6	0.0				11.0	0.0	24.5
Cycle Q Clear(g_c), s	0.0	51.8	51.8	15.3	41.6	0.0				11.0	0.0	24.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1668	746	574	2397	0				395	0	701
V/C Ratio(X)	0.00	1.12	1.09	0.86	0.70	0.00				0.51	0.00	1.38
Avail Cap(c_a), veh/h	0	1668	746	1122	2397	0				395	0	701
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	29.1	29.1	47.7	21.0	0.0				37.5	0.0	42.8
Incr Delay (d2), s/veh	0.0	61.2	60.0	0.1	0.2	0.0				0.5	0.0	180.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	39.4	35.0	7.4	20.3	0.0				5.4	0.0	28.1
LnGrp Delay(d),s/veh	0.0	90.3	89.1	47.8	21.2	0.0				38.0	0.0	222.8
LnGrp LOS		F	F	D	C					D		F
Approach Vol, veh/h		2675			2166						1169	
Approach Delay, s/veh		89.9			27.3						190.8	
Approach LOS		F			C						F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	22.7	57.3		30.0		80.0		
Change Period (Y+Rc), s	4.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	35.5	34.5		24.5		74.5		
Max Q Clear Time (g_c+I1), s	17.3	53.8		26.5		43.6		
Green Ext Time (p_c), s	0.8	0.0		0.0		25.7		

Intersection Summary	
HCM 2010 Ctrl Delay	87.0
HCM 2010 LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	649	1405	0	0	1417	288	639	18	688	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	184.5	186.3	0.0	0.0	188.1	188.1	186.3	187.5	188.1			
Adj Flow Rate, veh/h	676	1464	0	0	1476	300	905	0	476			
Adj No. of Lanes	2	2	0	0	2	1	2	0	1			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	2	0	0	1	1	2	0	1			
Cap, veh/h	776	2397	0	0	1460	651	790	0	356			
Arrive On Green	0.23	0.68	0.00	0.00	0.41	0.41	0.22	0.00	0.22			
Sat Flow, veh/h	3408	3632	0	0	3668	1593	3548	0	1599			
Grp Volume(v), veh/h	676	1464	0	0	1476	300	905	0	476			
Grp Sat Flow(s),veh/h/ln	1704	1770	0	0	1787	1593	1774	0	1599			
Q Serve(g_s), s	21.0	25.0	0.0	0.0	44.9	15.1	24.5	0.0	24.5			
Cycle Q Clear(g_c), s	21.0	25.0	0.0	0.0	44.9	15.1	24.5	0.0	24.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	776	2397	0	0	1460	651	790	0	356			
V/C Ratio(X)	0.87	0.61	0.00	0.00	1.01	0.46	1.15	0.00	1.34			
Avail Cap(c_a), veh/h	1100	2397	0	0	1460	651	790	0	356			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.09	0.09	0.00	0.00	0.79	0.79	1.00	0.00	1.00			
Uniform Delay (d), s/veh	40.9	9.8	0.0	0.0	32.5	23.7	42.8	0.0	42.8			
Incr Delay (d2), s/veh	0.6	0.1	0.0	0.0	23.6	1.8	80.0	0.0	169.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	9.9	12.0	0.0	0.0	26.9	6.9	20.7	0.0	27.5			
LnGrp Delay(d),s/veh	41.5	9.9	0.0	0.0	56.1	25.6	122.8	0.0	212.1			
LnGrp LOS	D	A			F	C	F		F			
Approach Vol, veh/h		2140			1776			1381				
Approach Delay, s/veh		19.9			50.9			153.6				
Approach LOS		B			D			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		80.0			29.6	50.4		30.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.5
Max Green Setting (Gmax), s		74.5			35.5	34.5		24.5
Max Q Clear Time (g_c+I1), s		27.0			23.0	46.9		26.5
Green Ext Time (p_c), s		24.8			2.0	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	65.1
HCM 2010 LOS	E

Notes

User approved volume balancing among the lanes for turning movement.

Intersection Level Of Service Report
#89: Pats Ranch Road / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	40.9
Analysis Method:	HCM2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.816

Intersection Setup

Name	Pats Ranch Road						Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	170.00	100.00	100.00
Speed [mph]	35.00			50.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			no			no			yes		

Volumes

Name	Pats Ranch Road						Limonite Avenue			Limonite Avenue		
Base Volume Input [veh/h]	302	0	151	0	0	0	0	1039	229	218	880	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	50	0	13	0	0	0	0	74	80	24	77	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	101	2	126	4	1	8	13	198	160	28	239	6
Right-Turn on Red Volume [veh/h]	0	0	64	0	0	0	0	0	87	0	0	0
Total Hourly Volume [veh/h]	465	2	232	4	1	8	13	1353	391	279	1231	6
Peak Hour Factor	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	124	1	62	1	0	2	3	361	104	75	329	2
Total Analysis Volume [veh/h]	497	2	248	4	1	9	14	1446	418	298	1315	6
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	6	0	5	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	4.7	0.0	3.0	4.7	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	54	31	0	32	9	0	9	30	0	27	48	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	11	0	0	0	0
Pedestrian Clearance [s]	0	20	0	0	0	0	0	13	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	3.7	0.0	2.0	3.7	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	no		no	no		no	yes		no	yes	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	5.70	5.70	4.00	5.70	5.70
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	3.70	3.70	2.00	3.70	3.70
g_i, Effective Green Time [s]	22	23	23	1	2	2	56	56	23	77	77
g / C, Green / Cycle	0.18	0.19	0.19	0.01	0.01	0.02	0.46	0.46	0.19	0.64	0.64
(v / s)_i Volume / Saturation Flow Rate	0.16	0.00	0.17	0.00	0.01	0.01	0.45	0.29	0.19	0.41	0.00
s, saturation flow rate [veh/h]	3101	1676	1425	1597	1447	1597	3192	1425	1597	3192	1425
c, Capacity [veh/h]	573	323	274	9	20	26	1476	659	306	2037	909
d1, Uniform Delay [s]	47.50	39.17	47.37	59.49	58.81	58.62	31.70	24.53	48.21	13.36	7.89
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.42	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.15	0.01	10.66	30.10	19.18	16.97	19.01	4.61	40.85	1.59	0.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.87	0.01	0.90	0.44	0.51	0.55	0.98	0.63	0.97	0.65	0.01
d, Delay for Lane Group [s/veh]	51.65	39.18	58.03	89.58	77.99	75.60	50.71	29.14	89.06	14.95	7.90
Lane Group LOS	D	D	E	F	E	E	D	C	F	B	A
Critical Lane Group	no	no	yes	yes	no	no	yes	no	yes	no	no
50th-Percentile Queue Length [veh]	7.45	0.05	7.96	0.19	0.40	0.53	22.85	9.33	12.04	9.93	0.05
50th-Percentile Queue Length [ft]	186.34	1.21	199.04	4.84	9.93	13.34	571.37	233.17	301.02	248.23	1.36
95th-Percentile Queue Length [veh]	11.93	0.09	12.59	0.35	0.71	0.96	30.70	14.34	17.73	15.10	0.10
95th-Percentile Queue Length [ft]	298.27	2.18	314.73	8.72	17.87	24.02	767.38	358.38	443.29	377.43	2.45

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.65	39.18	58.03	89.58	77.99	77.99	75.60	50.71	29.14	89.06	14.95	7.90
Movement LOS	D	D	E	F	E	E	E	D	C	F	B	A
d_A, Approach Delay [s/veh]	53.73			81.30			46.09			28.57		
Approach LOS	D			F			D			C		
d_I, Intersection Delay [s/veh]	40.89											
Intersection LOS	D											
Intersection V/C	0.816											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
#90: Pats Ranch Road / 65th Street

Control Type:	Signalized	Delay (sec / veh):	11.9
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.296

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	90.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Base Volume Input [veh/h]	81	114	10	51	250	8	34	6	27	7	22	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	59	0	0	112	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	80	0	0	138	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	15	0	0	14
Total Hourly Volume [veh/h]	84	258	10	53	510	8	35	6	13	7	23	6
Peak Hour Factor	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	24	75	3	15	148	2	10	2	4	2	7	2
Total Analysis Volume [veh/h]	98	300	12	62	594	9	41	7	15	8	27	7
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	0	1	6	0	0	4	0	0	8	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.6	3.6	0.0	3.6	3.6	0.0	0.0	3.6	0.0	0.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	12	27	0	12	27	0	0	31	0	0	31	0
Vehicle Extension [s]	2.5	2.5	0.0	2.5	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	15	0	0	15	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.6	2.6	0.0	2.6	2.6	0.0	0.0	2.6	0.0	0.0	2.6	0.0
Minimum Recall	no	no		no	no			no			no	
Maximum Recall	no	yes		no	yes			no			no	
Pedestrian Recall	no	no		no	no			no			no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	6	47	47	5	46	46	4	4	4	4
g / C, Green / Cycle	0.08	0.68	0.68	0.07	0.66	0.66	0.06	0.06	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.06	0.08	0.08	0.04	0.19	0.01	0.03	0.01	0.05	0.00
s, saturation flow rate [veh/h]	1597	1676	1651	1597	3192	1425	1240	1496	725	1425
c, Capacity [veh/h]	135	1137	1120	110	2116	945	103	82	103	78
d1, Uniform Delay [s]	31.17	3.94	3.94	31.45	4.87	3.99	34.89	31.63	32.55	31.32
k, delay calibration	0.08	0.50	0.50	0.08	0.50	0.50	0.08	0.08	0.08	0.08
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.48	0.22	0.22	3.29	0.33	0.02	1.82	1.28	1.43	0.36
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.73	0.12	0.12	0.56	0.28	0.01	0.40	0.27	0.34	0.09
d, Delay for Lane Group [s/veh]	36.64	4.16	4.17	34.75	5.20	4.01	36.71	32.91	33.98	31.68
Lane Group LOS	D	A	A	C	A	A	D	C	C	C
Critical Lane Group	yes	no	no	no	yes	no	no	no	yes	no
50th-Percentile Queue Length [veh]	1.74	0.54	0.54	1.07	1.35	0.04	0.76	0.38	0.62	0.12
50th-Percentile Queue Length [ft]	43.39	13.62	13.52	26.64	33.83	0.90	19.05	9.48	15.57	2.95
95th-Percentile Queue Length [veh]	3.12	0.98	0.97	1.92	2.44	0.06	1.37	0.68	1.12	0.21
95th-Percentile Queue Length [ft]	78.10	24.52	24.33	47.95	60.89	1.62	34.30	17.07	28.03	5.32

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	36.64	4.16	4.17	34.75	5.20	4.01	36.71	32.91	32.91	33.98	33.98	31.68
Movement LOS	D	A	A	C	A	A	D	C	C	C	C	C
d_A, Approach Delay [s/veh]	12.68			7.94			35.38			33.59		
Approach LOS	B			A			D			C		
d_I, Intersection Delay [s/veh]	11.94											
Intersection LOS	B											
Intersection V/C	0.296											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

The delay reported in the traffic study is higher than that calculated in this worksheet as the calculated delay is lower than the comparable previous scenario. This is due to the HCM 2010 methodology which reports delay as the average delay of all vehicles at the intersection. The lower delay in this scenario is due to the fact that the added volumes are to movements experiencing lower delays than most.

Intersection Level Of Service Report
#91: Pats Ranch Road / Driveway 1

Control Type:	Two-way stop	Delay (sec / veh):	10.2
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.016

Intersection Setup

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	150.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		yes	

Volumes

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Base Volume Input [veh/h]	0	205	284	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	59	56	56	0	10
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	80	138	0	0	0
Total Hourly Volume [veh/h]	0	352	489	56	0	10
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	96	133	15	0	3
Total Analysis Volume [veh/h]	0	383	532	61	0	11
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.01	0.00	0.00	0.02
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	10.23
Movement LOS		A	A	A		B
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.05
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	1.20
d_A, Approach Delay [s/veh]	0.00		0.00		10.23	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.11					
Intersection LOS	B					

Intersection Level Of Service Report
#92: Pats Ranch Road / Ivory Street

Control Type:	Two-way stop	Delay (sec / veh):	17.7
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 2			Ivory Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	150.00	100.00	100.00	200.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			no			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 2			Ivory Street		
Base Volume Input [veh/h]	0	189	16	27	257	0	0	0	0	6	0	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	48	0	0	0	10	56	59	0	16	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	80	0	0	138	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	48	277	17	28	415	56	59	0	16	6	0	17
Peak Hour Factor	0.8290	0.8290	0.8290	0.8290	0.8290	0.8290	0.8290	0.8290	0.8290	0.8290	0.8290	0.8290
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	84	5	8	125	17	18	0	5	2	0	5
Total Analysis Volume [veh/h]	58	334	21	34	501	68	71	0	19	7	0	21
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			no	
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			yes	yes
Number of Storage Spaces in Median	0	0	2	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.00	0.00	0.03	0.01	0.00	0.19	0.00	0.03	0.02	0.00	0.03
d_M, Delay for Movement [s/veh]	8.82	0.00	0.00	8.09	0.00	0.00	17.36	17.66	12.55	13.87	16.22	9.42
Movement LOS	A	A	A	A	A	A	C	C	B	B	C	A
95th-Percentile Queue Length [veh]	0.18	0.00	0.00	0.09	0.00	0.00	0.83	0.83	0.83	0.05	0.05	0.08
95th-Percentile Queue Length [ft]	4.61	0.00	0.00	2.18	0.00	0.00	20.86	20.86	20.86	1.29	1.29	1.93
d_A, Approach Delay [s/veh]	1.24			0.46			16.34			10.54		
Approach LOS	A			A			C			B		
d_I, Intersection Delay [s/veh]	2.25											
Intersection LOS	C											

Intersection Level Of Service Report
#93: Pats Ranch Road / 68th Street

Control Type:	All-way stop	Delay (sec / veh):	18.4
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	220.00
Speed [mph]	25.00			35.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			yes			no			no		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			68th Street			68th Street		
Base Volume Input [veh/h]	0	0	0	30	0	233	189	232	0	0	209	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	4	0	22	40	0	0	0	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	33	54	9	45	93	0	0	23	57	15	17	26
Total Hourly Volume [veh/h]	33	54	9	80	93	264	237	264	57	15	234	51
Peak Hour Factor	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	16	3	24	27	78	70	78	17	4	69	15
Total Analysis Volume [veh/h]	39	64	11	94	110	311	279	311	67	18	276	60
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.28	0.55	0.78	0.88	3.80	3.70	6.05	0.13	1.28	1.28	0.41
95th-Percentile Queue Length [ft]	7.07	13.66	19.40	21.90	94.94	92.40	151.36	3.30	31.93	31.93	10.28
Approach Delay [s/veh]	11.51		16.42			23.82		13.46			
Approach LOS	B		C			C		B			
Intersection Delay [s/veh]	18.41										
Intersection LOS	C										

Intersection Level Of Service Report
#94: Wineville Avenue / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	54.4
Analysis Method:	HCM2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.817

Intersection Setup

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Pocket Length [ft]	185.00	100.00	100.00	100.00	100.00	100.00	250.00	100.00	360.00	245.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Base Volume Input [veh/h]	51	46	33	127	90	194	169	956	65	52	853	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	11	0	0	0	0	11	11	65	11	0	79	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	16	2	4	17	4	44	67	249	11	7	213	28
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	32	0	0	0
Total Hourly Volume [veh/h]	80	50	38	149	98	257	254	1308	58	61	1179	105
Peak Hour Factor	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	14	10	40	27	70	69	354	16	17	319	28
Total Analysis Volume [veh/h]	87	54	41	161	106	278	275	1417	63	66	1277	114
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	26.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	5	0	4	5	0	4	6	0	4	6	0
Maximum Green [s]	37	58	0	37	58	0	20	0	0	75	0	0
Amber [s]	3.0	4.3	0.0	3.0	4.3	0.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0
Split [s]	10	32	0	15	37	0	22	53	0	20	51	0
Vehicle Extension [s]	1.5	2.0	0.0	1.5	2.0	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Walk [s]	0	5	0	0	5	0	0	10	0	0	10	0
Pedestrian Clearance [s]	0	21	0	0	16	0	0	13	0	0	12	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	1.5	3.3	0.0	1.5	3.3	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	no		no	no		no	yes		no	yes	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	L	C	R	L	C	C
L, Total Lost Time per Cycle [s]	3.50	5.30	5.30	3.50	5.30	3.50	6.00	6.00	3.50	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.50	3.30	3.30	1.50	3.30	1.50	4.00	4.00	1.50	4.00	4.00
g_i, Effective Green Time [s]	7	25	25	12	30	19	60	60	6	47	47
g / C, Green / Cycle	0.05	0.20	0.20	0.10	0.25	0.15	0.50	0.50	0.05	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.05	0.03	0.03	0.09	0.23	0.16	0.40	0.04	0.04	0.38	0.38
s, saturation flow rate [veh/h]	1774	1863	1611	1774	1652	1774	3547	1583	1774	1863	1810
c, Capacity [veh/h]	97	379	328	171	405	273	1770	790	87	734	713
d1, Uniform Delay [s]	56.45	39.11	39.21	53.97	44.58	50.82	25.11	15.70	56.45	35.46	35.61
k, delay calibration	0.26	0.04	0.04	0.35	0.32	0.44	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	43.36	0.06	0.07	44.93	24.86	52.51	3.91	0.20	5.09	24.51	26.22
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.90	0.13	0.14	0.94	0.95	1.01	0.80	0.08	0.76	0.96	0.97
d, Delay for Lane Group [s/veh]	99.82	39.16	39.28	98.90	69.44	103.33	29.02	15.90	61.53	59.96	61.83
Lane Group LOS	F	D	D	F	E	F	C	B	E	E	E
Critical Lane Group	yes	no	no	no	yes	yes	no	no	no	no	yes
50th-Percentile Queue Length [veh]	3.73	1.16	1.10	6.84	13.60	11.95	16.47	0.91	2.02	23.31	23.19
50th-Percentile Queue Length [ft]	93.15	28.88	27.52	170.91	339.89	298.66	411.78	22.64	50.57	582.75	579.74
95th-Percentile Queue Length [veh]	6.71	2.08	1.98	11.12	19.64	17.67	23.13	1.63	3.64	31.23	31.09
95th-Percentile Queue Length [ft]	167.67	51.99	49.54	278.10	491.06	441.77	578.18	40.76	91.02	780.70	777.18

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	99.82	39.18	39.28	98.90	69.44	69.44	103.33	29.02	15.90	61.53	60.80	61.83
Movement LOS	F	D	D	F	E	E	F	C	B	E	E	E
d_A, Approach Delay [s/veh]	68.19			78.14			40.20			60.91		
Approach LOS	E			E			D			E		
d_I, Intersection Delay [s/veh]	54.40											
Intersection LOS	D											
Intersection V/C	0.817											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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APPENDIX 7.2:

EAPC (2016) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
(Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		EAPC (2016)
				CALC	DL	DATE	06/03/14
Jurisdiction:	City of Jurupa Valley			CHK	DL	DATE	06/03/14
Major Street:	Pats Ranch Road				Critical Approach Speed (Major)		35 mph
Minor Street:	Driveway 1				Critical Approach Speed (Minor)		25 mph

Major Street Approach Lanes = **2** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **10,859** vpd

Minor Street Future ADT = **607** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1	*1*	8,000	5,600	2,400	1,680
2 + **10,859**	*1* **607**	9,600 *	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1	*1*	12,000	8,400	1,200	850
2 + **10,859**	*1* **607**	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX				
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 25% **B** 51%	2 CONDITIONS 80%		2 CONDITIONS 80%	

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM		TRAFFIC CONDITIONS		EAPC (2016)
				CALC	DL	DATE	06/03/14
Jurisdiction:	City of Jurupa Valley			CHK	DL	DATE	06/03/14
Major Street:	Pats Ranch Road				Critical Approach Speed (Major)		35 mph
Minor Street:	Ivory Street				Critical Approach Speed (Minor)		25 mph

Major Street Approach Lanes = **2** lane

Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **10,177** vpd

Minor Street Future ADT = **713** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1	*1*	8,000	5,600	2,400	1,680
2 + **10,177**	*1* **713**	9,600 *	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1	*1*	12,000	8,400	1,200	850
2 + **10,177**	*1* **713**	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX				
No one condition satisfied, but following conditions fulfilled 80% of more …..	A 30% B 59%	2 CONDITIONS 80%		2 CONDITIONS 80%	

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

APPENDIX 7.3:

EAPC (2016) CONDITIONS QUEUING ANALYSIS WORKSHEETS

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Intersection: 9: Pats Ranch Rd. & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	L	R	L
Maximum Queue (ft)	26	397	377	300	250	448	383	14	136	173	66	23
Average Queue (ft)	2	175	193	51	158	181	170	0	65	91	25	6
95th Queue (ft)	12	298	296	164	247	363	330	5	129	149	49	21
Link Distance (ft)		1017	1017			778	778	778		718	718	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			200	165				200			300
Storage Blk Time (%)		8	8		4	10						
Queuing Penalty (veh)		0	14		26	20						

Intersection: 9: Pats Ranch Rd. & Limonite Av.

Movement	SB
Directions Served	TR
Maximum Queue (ft)	20
Average Queue (ft)	6
95th Queue (ft)	20
Link Distance (ft)	607
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Wineville Av. & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	T	TR	L	TR
Maximum Queue (ft)	132	316	303	53	70	364	347	154	107	61	165	246
Average Queue (ft)	75	132	145	18	21	268	241	63	36	20	75	136
95th Queue (ft)	133	298	303	47	54	361	329	131	79	50	140	241
Link Distance (ft)		778	778			2416	2416		1217	1217		592
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	250			360	250			185			100	
Storage Blk Time (%)		2				10					8	20
Queuing Penalty (veh)		2				3					21	14

Intersection: 33: I-15 SB Ramps & Limonite Av.

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	1190	1214	325	225	244	322	319	225	328	257
Average Queue (ft)	1171	1167	241	172	163	32	33	87	213	168
95th Queue (ft)	1187	1193	395	224	237	159	172	205	284	247
Link Distance (ft)	1150	1150				649	649		1306	
Upstream Blk Time (%)	45	21								
Queuing Penalty (veh)	0	0								
Storage Bay Dist (ft)			150	275	275			400		400
Storage Blk Time (%)		22	20							
Queuing Penalty (veh)		152	146							

Intersection: 34: I-15 NB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	289	309	178	256	1042	1064	325	312	330	312
Average Queue (ft)	148	145	67	87	831	770	231	181	232	165
95th Queue (ft)	266	273	157	211	1069	1116	412	293	307	269
Link Distance (ft)			649	649	1017	1017			1256	
Upstream Blk Time (%)					4	3				
Queuing Penalty (veh)					26	25				
Storage Bay Dist (ft)	300	300					150	450		450
Storage Blk Time (%)	0	0				50	10			
Queuing Penalty (veh)	0	1				196	70			

Network Summary

Network wide Queuing Penalty: 715

Intersection: 9: Pats Ranch Rd. & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	L	T	R
Maximum Queue (ft)	284	413	437	300	249	427	299	14	270	286	26	209
Average Queue (ft)	18	297	293	189	188	173	90	0	131	178	1	115
95th Queue (ft)	102	386	402	380	283	356	190	5	228	272	9	187
Link Distance (ft)		1017	1017			778	778	778		718	718	718
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			200	165				200			
Storage Blk Time (%)		27	25	0	13	3			1	6		
Queuing Penalty (veh)		3	121	0	82	8			2	15		

Intersection: 9: Pats Ranch Rd. & Limonite Av.

Movement	SB	SB
Directions Served	L	TR
Maximum Queue (ft)	22	38
Average Queue (ft)	3	7
95th Queue (ft)	14	23
Link Distance (ft)		631
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 12: Wineville Av. & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	T	TR	L	TR
Maximum Queue (ft)	350	693	713	44	350	758	762	154	42	85	165	626
Average Queue (ft)	319	399	368	12	114	518	493	56	17	21	159	539
95th Queue (ft)	406	760	770	33	331	706	682	116	38	59	200	730
Link Distance (ft)		778	778			2416	2416		1217	1217		592
Upstream Blk Time (%)												31
Queuing Penalty (veh)												0
Storage Bay Dist (ft)	250			360	250			185			100	
Storage Blk Time (%)	57	3	0			50					69	54
Queuing Penalty (veh)	373	6	0			31					243	81

Intersection: 33: I-15 SB Ramps & Limonite Av.

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	1189	1202	325	199	213	220	310	410	424	365
Average Queue (ft)	1150	1164	325	125	122	45	38	202	316	273
95th Queue (ft)	1217	1208	326	177	177	148	154	328	402	366
Link Distance (ft)	1150	1150				649	649		1306	
Upstream Blk Time (%)	15	32								
Queuing Penalty (veh)	0	0								
Storage Bay Dist (ft)			150	275	275			400		400
Storage Blk Time (%)		46	24					0	1	
Queuing Penalty (veh)		356	217					0	3	

Intersection: 34: I-15 NB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	202	215	330	262	1048	1041	325	548	588	550
Average Queue (ft)	117	125	102	116	824	834	289	374	438	374
95th Queue (ft)	193	195	227	255	1162	1197	437	502	554	510
Link Distance (ft)			649	649	1017	1017			1256	
Upstream Blk Time (%)					2	3				
Queuing Penalty (veh)					20	29				
Storage Bay Dist (ft)	300	300					150	450		450
Storage Blk Time (%)			0			57		0	7	0
Queuing Penalty (veh)			2			165		5	45	1

Network Summary

Network wide Queuing Penalty: 1807

APPENDIX 7.4:

EAPC (2016) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1437	680	659	1134	0	0	0	0	142	0	609
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0.0	182.7	182.7	184.5	175.9	0.0				179.2	182.5	182.7
Adj Flow Rate, veh/h	0	1481	701	679	1169	0				97	0	680
Adj No. of Lanes	0	3	1	2	3	0				1	0	2
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	4	4	3	8	0				6	0	4
Cap, veh/h	0	2515	713	737	3760	0				334	0	604
Arrive On Green	0.00	0.46	0.46	0.22	0.71	0.00				0.20	0.00	0.20
Sat Flow, veh/h	0	5481	1553	3408	5278	0				1707	0	3082
Grp Volume(v), veh/h	0	1481	701	679	1169	0				97	0	680
Grp Sat Flow(s),veh/h/ln	0	1827	1553	1704	1759	0				1707	0	1541
Q Serve(g_s), s	0.0	24.0	53.4	23.4	9.8	0.0				5.8	0.0	23.5
Cycle Q Clear(g_c), s	0.0	24.0	53.4	23.4	9.8	0.0				5.8	0.0	23.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2515	713	737	3760	0				334	0	604
V/C Ratio(X)	0.00	0.59	0.98	0.92	0.31	0.00				0.29	0.00	1.13
Avail Cap(c_a), veh/h	0	2515	713	809	3760	0				334	0	604
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.45	0.45	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	24.1	32.0	46.0	6.4	0.0				41.1	0.0	48.2
Incr Delay (d2), s/veh	0.0	0.2	29.5	7.5	0.1	0.0				0.2	0.0	76.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.1	28.6	11.8	4.8	0.0				2.8	0.0	16.4
LnGrp Delay(d),s/veh	0.0	24.3	61.5	53.5	6.5	0.0				41.3	0.0	125.0
LnGrp LOS		C	E	D	A					D		F
Approach Vol, veh/h		2182			1848						777	
Approach Delay, s/veh		36.3			23.7						114.5	
Approach LOS		D			C						F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	30.4	60.6		29.0		91.0		
Change Period (Y+Rc), s	4.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	28.5	52.5		23.5		85.5		
Max Q Clear Time (g_c+I1), s	25.4	55.4		25.5		11.8		
Green Ext Time (p_c), s	0.5	0.0		0.0		26.9		

Intersection Summary	
HCM 2010 Ctrl Delay	44.1
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	841	739	0	0	1353	393	440	2	302	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	182.7	179.2	0.0	0.0	181.0	182.7	174.3	176.2	181.0			
Adj Flow Rate, veh/h	904	795	0	0	1455	423	575	0	217			
Adj No. of Lanes	2	3	0	0	3	1	2	0	1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	4	6	0	0	5	4	9	0	5			
Cap, veh/h	977	3364	0	0	1782	558	733	0	340			
Arrive On Green	0.29	0.69	0.00	0.00	0.36	0.36	0.22	0.00	0.22			
Sat Flow, veh/h	3375	5055	0	0	5103	1546	3320	0	1538			
Grp Volume(v), veh/h	904	795	0	0	1455	423	575	0	217			
Grp Sat Flow(s),veh/h/ln	1688	1631	0	0	1647	1546	1660	0	1538			
Q Serve(g_s), s	31.2	7.3	0.0	0.0	32.0	28.9	19.6	0.0	15.4			
Cycle Q Clear(g_c), s	31.2	7.3	0.0	0.0	32.0	28.9	19.6	0.0	15.4			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	977	3364	0	0	1782	558	733	0	340			
V/C Ratio(X)	0.93	0.24	0.00	0.00	0.82	0.76	0.78	0.00	0.64			
Avail Cap(c_a), veh/h	1055	3364	0	0	1782	558	733	0	340			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.81	0.81	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	41.4	7.0	0.0	0.0	34.8	33.8	44.1	0.0	42.4			
Incr Delay (d2), s/veh	10.8	0.1	0.0	0.0	4.3	9.3	8.2	0.0	8.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	16.0	3.3	0.0	0.0	15.3	13.8	9.8	0.0	7.3			
LnGrp Delay(d),s/veh	52.2	7.1	0.0	0.0	39.0	43.1	52.3	0.0	51.3			
LnGrp LOS	D	A			D	D	D		D			
Approach Vol, veh/h		1699			1878			792				
Approach Delay, s/veh		31.1			40.0			52.0				
Approach LOS		C			D			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		88.0			39.2	48.8		32.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.5
Max Green Setting (Gmax), s		82.5			37.5	40.5		26.5
Max Q Clear Time (g_c+I1), s		9.3			33.2	34.0		21.6
Green Ext Time (p_c), s		17.5			1.5	5.0		1.4

Intersection Summary	
HCM 2010 Ctrl Delay	38.7
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Option 1: AM Improvements

Number	93											
Intersection	Pats Ranch Road / 68th Street											
Control Type	Signalized											
Analysis Method	HCM 2010											
Name				Pats Ranch Road			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Base Volume Input [veh/h]	0	0	0	25	0	193	250	407	0	0	379	35
Total Analysis Volume [veh/h]	68	111	18	65	38	326	365	582	23	7	559	106

Intersection Settings

Cycle Length [s]	90											
Coordination Type	Time of Day Pattern Coordinated											
Actuation Type	Fully actuated											
Lost time [s]	0.00											
Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	3	3	8	0	7	4	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	10	10	0	10	10	10	10	10	0	10	10	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.0	5.0	0.0	3.0	5.0	3.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	1.0	2.0	0.0	1.0	2.0	1.0	1.0	2.0	0.0	1.0	2.0	0.0
Split [s]	14	27	0	14	27	15	15	35	0	14	34	0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	no	no		no	no	no	no	no		no	no	
Maximum Recall	no	no		no	no	no	no	yes		no	yes	
Pedestrian Recall	no	no		no	no	no	no	no		no	no	

Lane Group Calculations

g / C, Green / Cycle	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00
(v / s)_i Volume / Saturation Flow Rate	0.04	0.08	0.17	0.02	0.23	0.56	0.29	0.07	0.01	0.18	0.07
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Arrival type	3		3			3			3		
s, saturation flow rate [veh/h]	1597	1636	382	1676	1425	653	1676	1617	625	3192	1425
c, Capacity [veh/h]	0	0	327	0	453	327	0	0	327	0	0
X, volume / capacity	0.00	0.00	0.20	0.00	0.72	1.12	0.00	0.00	0.02	0.00	0.00
d, Delay for Lane Group [s/veh]	0.00	0.00	12.36	0.00	16.08	95.53	0.00	0.00	11.03	0.00	0.00
Lane Group LOS	A	A	B	A	B	F	A	A	B	A	A
Critical Lane Group	no	no	no	no	yes	no	no	no	no	no	no
50th-Percentile Queue Length [veh]	0.00	0.00	0.36	0.00	1.64	9.36	0.00	0.00	0.02	0.00	0.00
50th-Percentile Queue Length [ft]	0.00	0.00	8.96	0.00	40.92	233.89	0.00	0.00	0.51	0.00	0.00
95th-Percentile Queue Length [veh]	0.00	0.00	0.65	0.00	2.95	14.37	0.00	0.00	0.04	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	16.13	0.00	73.65	359.29	0.00	0.00	0.92	0.00	0.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	12.36	0.00	16.08	95.53	0.00	0.00	11.03	0.00	0.00
Movement LOS	A	A	A	B	A	B	F	A	A	B	A	A
Critical Movement	no	no	no	no	no	no	yes	no	no	no	no	no
d_A, Approach Delay [s/veh]	0.00			14.09			35.95			0.11		
Approach LOS	A			B			D			A		
d_I, Intersection Delay [s/veh]	18.07											
Intersection LOS	B											
Intersection V/C	0.208											

Option 1: Mid-Day Improvements

Number	93											
Intersection	Pats Ranch Road / 68th Street											
Control Type	Signalized											
Analysis Method	HCM 2010											
Name	Pats Ranch Road			Pats Ranch Road			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Base Volume Input [veh/h]	0	0	0	28	0	231	187	253	0	0	307	41
Total Analysis Volume [veh/h]	49	80	13	115	93	386	345	422	57	15	496	114

Intersection Settings

Cycle Length [s]	90											
Coordination Type	Time of Day Pattern Coordinated											
Actuation Type	Fully actuated											
Lost time [s]	0.00											
Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	3	3	8	0	7	4	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	10	10	0	10	10	10	10	10	0	10	10	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.0	5.0	0.0	3.0	5.0	3.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	1.0	2.0	0.0	1.0	2.0	1.0	1.0	2.0	0.0	1.0	2.0	0.0
Split [s]	14	27	0	14	27	15	15	35	0	14	34	0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	no	no		no	no	no	no	no		no	no	
Maximum Recall	no	no		no	no	no	no	yes		no	yes	
Pedestrian Recall	no	no		no	no	no	no	no		no	no	

Lane Group Calculations

g / C, Green / Cycle	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00
(v / s)_i Volume / Saturation Flow Rate	0.03	0.06	0.24	0.06	0.27	0.51	0.25	0.04	0.02	0.16	0.08
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Arrival type	3		3			3			3		
s, saturation flow rate [veh/h]	1597	1636	474	1676	1425	680	1676	1425	691	3192	1425
c, Capacity [veh/h]	0	0	327	0	453	327	0	0	327	0	0
X, volume / capacity	0.00	0.00	0.35	0.00	0.85	1.05	0.00	0.00	0.05	0.00	0.00
d, Delay for Lane Group [s/veh]	0.00	0.00	13.95	0.00	24.94	75.70	0.00	0.00	11.06	0.00	0.00
Lane Group LOS	A	A	B	A	C	F	A	A	B	A	A
Critical Lane Group	no	no	no	no	yes	no	no	no	no	no	no
50th-Percentile Queue Length [veh]	0.00	0.00	0.72	0.00	2.82	7.49	0.00	0.00	0.04	0.00	0.00
50th-Percentile Queue Length [ft]	0.00	0.00	18.10	0.00	70.43	187.20	0.00	0.00	1.11	0.00	0.00
95th-Percentile Queue Length [veh]	0.00	0.00	1.30	0.00	5.07	11.98	0.00	0.00	0.08	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	32.57	0.00	126.77	299.39	0.00	0.00	1.99	0.00	0.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	13.95	0.00	24.94	75.70	0.00	0.00	11.06	0.00	0.00
Movement LOS	A	A	A	B	A	C	F	A	A	B	A	A
Critical Movement	no	no	no	no	no	no	yes	no	no	no	no	no
d_A, Approach Delay [s/veh]	0.00			18.91			31.69			0.27		
Approach LOS	A			B			C			A		
d_I, Intersection Delay [s/veh]	17.17											
Intersection LOS	B											
Intersection V/C	0.246											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1769	772	468	1589	0	0	0	0	287	1	816
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0.0	186.3	186.3	188.1	186.3	0.0				186.3	186.3	186.3
Adj Flow Rate, veh/h	0	1862	813	493	1673	0				202	0	967
Adj No. of Lanes	0	3	1	2	3	0				1	0	2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	1	2	0				2	0	2
Cap, veh/h	0	2142	607	521	3322	0				503	0	892
Arrive On Green	0.00	0.38	0.38	0.30	1.00	0.00				0.28	0.00	0.28
Sat Flow, veh/h	0	5588	1583	3476	5588	0				1774	0	3150
Grp Volume(v), veh/h	0	1862	813	493	1673	0				202	0	967
Grp Sat Flow(s),veh/h/ln	0	1863	1583	1738	1863	0				1774	0	1575
Q Serve(g_s), s	0.0	27.7	34.5	12.5	0.0	0.0				8.3	0.0	25.5
Cycle Q Clear(g_c), s	0.0	27.7	34.5	12.5	0.0	0.0				8.3	0.0	25.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2142	607	521	3322	0				503	0	892
V/C Ratio(X)	0.00	0.87	1.34	0.95	0.50	0.00				0.40	0.00	1.08
Avail Cap(c_a), veh/h	0	2142	607	521	3322	0				503	0	892
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.32	0.32	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	25.7	27.7	31.1	0.0	0.0				26.1	0.0	32.3
Incr Delay (d2), s/veh	0.0	4.0	163.7	11.7	0.2	0.0				0.2	0.0	55.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.9	42.6	6.7	0.1	0.0				4.1	0.0	17.9
LnGrp Delay(d),s/veh	0.0	29.6	191.4	42.8	0.2	0.0				26.3	0.0	87.6
LnGrp LOS		C	F	D	A					C		F
Approach Vol, veh/h		2675			2166						1169	
Approach Delay, s/veh		78.8			9.9						77.0	
Approach LOS		E			A						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	19.0	40.0		31.0		59.0		
Change Period (Y+Rc), s	5.5	* 5.5		5.5		5.5		
Max Green Setting (Gmax), s	13.5	* 34.5		25.5		53.5		
Max Q Clear Time (g_c+I1), s	14.5	36.5		27.5		2.0		
Green Ext Time (p_c), s	0.0	0.0		0.0		11.5		

Intersection Summary	
HCM 2010 Ctrl Delay	53.6
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	649	1405	0	0	1417	288	639	18	688	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	184.5	186.3	0.0	0.0	188.1	188.1	186.3	187.5	188.1			
Adj Flow Rate, veh/h	676	1464	0	0	1476	300	905	0	476			
Adj No. of Lanes	2	3	0	0	3	1	2	0	1			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	2	0	0	1	1	2	0	1			
Cap, veh/h	629	2910	0	0	1678	520	1084	0	489			
Arrive On Green	0.18	0.57	0.00	0.00	0.33	0.33	0.31	0.00	0.31			
Sat Flow, veh/h	3408	5253	0	0	5305	1592	3548	0	1599			
Grp Volume(v), veh/h	676	1464	0	0	1476	300	905	0	476			
Grp Sat Flow(s),veh/h/ln	1704	1695	0	0	1712	1592	1774	0	1599			
Q Serve(g_s), s	16.6	15.6	0.0	0.0	24.4	14.1	21.4	0.0	26.5			
Cycle Q Clear(g_c), s	16.6	15.6	0.0	0.0	24.4	14.1	21.4	0.0	26.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	629	2910	0	0	1678	520	1084	0	489			
V/C Ratio(X)	1.08	0.50	0.00	0.00	0.88	0.58	0.83	0.00	0.97			
Avail Cap(c_a), veh/h	629	2910	0	0	1678	520	1084	0	489			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.44	0.44	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	36.7	11.6	0.0	0.0	28.6	25.1	29.1	0.0	30.9			
Incr Delay (d2), s/veh	47.0	0.3	0.0	0.0	7.0	4.6	7.6	0.0	34.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	11.9	7.3	0.0	0.0	12.6	6.8	11.6	0.0	16.4			
LnGrp Delay(d),s/veh	83.7	11.8	0.0	0.0	35.6	29.8	36.7	0.0	65.7			
LnGrp LOS	F	B			D	C	D		E			
Approach Vol, veh/h		2140			1776			1381				
Approach Delay, s/veh		34.5			34.6			46.7				
Approach LOS		C			C			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		57.0			22.1	34.9		33.0
Change Period (Y+Rc), s		5.5			5.5	* 5.5		5.5
Max Green Setting (Gmax), s		51.5			16.6	* 29.4		27.5
Max Q Clear Time (g_c+I1), s		17.6			18.6	26.4		28.5
Green Ext Time (p_c), s		11.7			0.0	2.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	37.7
HCM 2010 LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Option 1: PM Improvements

Number	93											
Intersection	Pats Ranch Road / 68th Street											
Control Type	Signalized											
Analysis Method	HCM 2010											
Name	Pats Ranch Road			Pats Ranch Road			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Base Volume Input [veh/h]	0	0	0	30	0	233	189	232	0	0	209	16
Total Analysis Volume [veh/h]	39	64	11	94	110	311	279	311	67	18	276	60

Intersection Settings

Cycle Length [s]	90											
Coordination Type	Time of Day Pattern Coordinated											
Actuation Type	Fully actuated											
Lost time [s]	0.00											
Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	3	3	8	0	7	4	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	10	10	0	10	10	10	10	10	0	10	10	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.0	5.0	0.0	3.0	5.0	3.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	1.0	2.0	0.0	1.0	2.0	1.0	1.0	2.0	0.0	1.0	2.0	0.0
Split [s]	14	27	0	14	27	15	15	35	0	14	34	0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	no	no		no	no	no	no	no		no	no	
Maximum Recall	no	no		no	no	no	no	yes		no	yes	
Pedestrian Recall	no	no		no	no	no	no	no		no	no	

Lane Group Calculations

g / C, Green / Cycle	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00
(v / s)_i Volume / Saturation Flow Rate	0.02	0.05	0.14	0.07	0.22	0.33	0.19	0.05	0.02	0.09	0.04
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Arrival type	3		3			3			3		
s, saturation flow rate [veh/h]	1597	1634	651	1676	1425	834	1676	1425	759	3192	1425
c, Capacity [veh/h]	0	0	327	0	453	327	0	0	327	0	0
X, volume / capacity	0.00	0.00	0.29	0.00	0.69	0.85	0.00	0.00	0.06	0.00	0.00
d, Delay for Lane Group [s/veh]	0.00	0.00	13.20	0.00	14.25	34.48	0.00	0.00	11.07	0.00	0.00
Lane Group LOS	A	A	B	A	B	C	A	A	B	A	A
Critical Lane Group	no	no	no	no	yes	no	no	no	no	no	no
50th-Percentile Queue Length [veh]	0.00	0.00	0.53	0.00	1.39	3.20	0.00	0.00	0.05	0.00	0.00
50th-Percentile Queue Length [ft]	0.00	0.00	13.24	0.00	34.78	80.04	0.00	0.00	1.33	0.00	0.00
95th-Percentile Queue Length [veh]	0.00	0.00	0.95	0.00	2.50	5.76	0.00	0.00	0.10	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	23.84	0.00	62.60	144.08	0.00	0.00	2.40	0.00	0.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	13.20	0.00	14.25	34.48	0.00	0.00	11.07	0.00	0.00
Movement LOS	A	A	A	B	A	B	C	A	A	B	A	A
Critical Movement	no	no	no	no	no	no	yes	no	no	no	no	no
d_A, Approach Delay [s/veh]	0.00			11.02			14.64			0.56		
Approach LOS	A			B			B			A		
d_I, Intersection Delay [s/veh]	9.45											
Intersection LOS	A											
Intersection V/C	0.198											

APPENDIX 7.5:

EAPC (2016) CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Intersection: 9: Pats Ranch Rd. & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	L	L	R	L	TR
Maximum Queue (ft)	26	351	350	96	215	99	113	198	212	90	31	54
Average Queue (ft)	1	177	190	38	99	39	41	70	88	39	7	13
95th Queue (ft)	9	271	280	74	168	84	88	137	150	70	26	37
Link Distance (ft)		1018	1018	1018		778	778		718	718		608
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200				165			200			300	
Storage Blk Time (%)		4			1			0	1			
Queuing Penalty (veh)		0			4			0	1			

Intersection: 12: Wineville Av. & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	T	TR	L	TR
Maximum Queue (ft)	110	81	69	65	349	438	401	129	64	61	165	217
Average Queue (ft)	71	13	30	7	42	316	283	63	30	21	67	140
95th Queue (ft)	114	48	68	31	180	418	383	105	64	49	130	206
Link Distance (ft)		778	778			2416	2416		1217	1217		592
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	250			360	250			185			100	
Storage Blk Time (%)						21					2	21
Queuing Penalty (veh)						6					5	15

Intersection: 33: I-15 SB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	R	L	L	T	T	T	L	LTR	R
Maximum Queue (ft)	1195	1202	1166	325	324	333	224	249	179	212	305	275
Average Queue (ft)	1174	1164	661	224	248	254	113	103	95	88	219	182
95th Queue (ft)	1192	1197	1390	350	304	307	188	178	161	195	287	272
Link Distance (ft)	1150	1150	1150				644	644	644		1295	
Upstream Blk Time (%)	78	27	2									
Queuing Penalty (veh)	0	0	0									
Storage Bay Dist (ft)				150	275	275				400		400
Storage Blk Time (%)			2	18	3	5						
Queuing Penalty (veh)			11	87	10	19						

Intersection: 33: I-15 SB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	R	L	L	T	T	T	L	LTR	R
Maximum Queue (ft)	1221	1202	743	325	258	256	35	29	54	201	285	235
Average Queue (ft)	693	567	200	233	156	161	11	7	28	77	189	138
95th Queue (ft)	1094	1026	472	342	229	234	33	26	55	168	265	240
Link Distance (ft)	1187	1187	1187				699	699	699		1086	
Upstream Blk Time (%)	2	1										
Queuing Penalty (veh)	0	0										
Storage Bay Dist (ft)				150	275	275				400		400
Storage Blk Time (%)			2	19	0	0						
Queuing Penalty (veh)			13	93	0	0						

Intersection: 34: I-15 NB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	269	232	89	94	139	797	762	400	325	280	342	272
Average Queue (ft)	141	155	14	10	22	542	474	210	134	197	240	167
95th Queue (ft)	196	209	55	47	78	762	691	348	267	273	309	273
Link Distance (ft)			699	699	699	1131	1131	1131			1246	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300	300							150	450		450
Storage Blk Time (%)								8	6			
Queuing Penalty (veh)								31	27			

Network Summary

Network wide Queuing Penalty: 163

Intersection: 9: Pats Ranch Rd. & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	L	R	L
Maximum Queue (ft)	49	1037	1051	1058	250	437	399	20	248	328	197	30
Average Queue (ft)	14	495	495	262	198	237	198	1	116	161	110	2
95th Queue (ft)	42	995	996	883	287	445	395	8	199	248	190	15
Link Distance (ft)		1018	1018	1018		778	778	778		718	718	
Upstream Blk Time (%)		4	5	1								
Queuing Penalty (veh)		27	35	7								
Storage Bay Dist (ft)	200				165				200			300
Storage Blk Time (%)		46			17	11			0	2		
Queuing Penalty (veh)		6			105	32			0	4		

Intersection: 9: Pats Ranch Rd. & Limonite Av.

Movement	SB
Directions Served	TR
Maximum Queue (ft)	30
Average Queue (ft)	9
95th Queue (ft)	29
Link Distance (ft)	631
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Wineville Av. & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	T	TR	L	TR
Maximum Queue (ft)	350	741	787	660	350	657	614	242	64	40	165	631
Average Queue (ft)	320	550	534	104	108	430	397	77	25	16	139	334
95th Queue (ft)	235	787	743	363	310	616	581	176	50	37	200	568
Link Distance (ft)		778	778			2416	2416		1217	1217		592
Upstream Blk Time (%)			0									2
Queuing Penalty (veh)			1									0
Storage Bay Dist (ft)	250			360	250			185			100	
Storage Blk Time (%)	68	9	4			41		5			42	46
Queuing Penalty (veh)	445	22	3			25		1			149	69

Intersection: 33: I-15 SB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	R	L	L	T	T	T	L	LTR	R
Maximum Queue (ft)	652	598	679	325	172	163	50	70	52	297	495	470
Average Queue (ft)	484	433	343	297	109	94	23	14	24	152	274	226
95th Queue (ft)	593	568	573	375	164	160	48	46	46	266	390	343
Link Distance (ft)	1187	1187	1187				699	699	699		1086	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				150	275	275				400		400
Storage Blk Time (%)			15	47							1	
Queuing Penalty (veh)			119	278							3	

Intersection: 34: I-15 NB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	227	237	116	104	95	483	413	300	148	377	394	328
Average Queue (ft)	144	166	55	36	25	331	271	173	61	234	303	245
95th Queue (ft)	211	222	99	76	65	437	372	274	114	314	384	317
Link Distance (ft)			699	699	699	1131	1131	1131			1246	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300	300							150	450		450
Storage Blk Time (%)								5	0			
Queuing Penalty (veh)								13	0			

Network Summary

Network wide Queuing Penalty: 413

APPENDIX 8.1:

HORIZON YEAR (2035) WITHOUT PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Intersection Level Of Service Report
#86: Hamner Avenue / 68th Street

Control Type:	Signalized	Delay (sec / veh):	48.7
Analysis Method:	HCM2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.633

Intersection Setup

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	280.00	100.00	100.00	250.00	100.00	100.00	200.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Base Volume Input [veh/h]	55	847	194	82	708	54	153	204	92	309	199	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	62	0	0	18	0	0	18	0	0	32
Total Hourly Volume [veh/h]	55	847	132	82	708	36	153	204	74	309	199	122
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	230	36	22	192	10	42	55	20	84	54	33
Total Analysis Volume [veh/h]	60	921	143	89	770	39	166	222	80	336	216	133
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0
All red [s]	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Split [s]	12	34	0	12	34	0	23	34	0	25	36	0
Vehicle Extension [s]	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	L	C	R
L, Total Lost Time per Cycle [s]	5.00	7.00	7.00	5.00	7.00	7.00	5.00	7.00	5.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	5.00	5.00	3.00	5.00	5.00	3.00	5.00	3.00	5.00	5.00
g_i, Effective Green Time [s]	6	32	32	7	33	33	13	22	20	29	29
g / C, Green / Cycle	0.06	0.30	0.30	0.07	0.32	0.32	0.12	0.21	0.19	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.04	0.18	0.18	0.06	0.14	0.14	0.10	0.19	0.21	0.13	0.09
s, saturation flow rate [veh/h]	1597	3192	1535	1597	3192	1627	1597	1602	1597	1676	1425
c, Capacity [veh/h]	88	965	464	109	1008	514	192	338	303	469	399
d1, Uniform Delay [s]	48.70	31.06	31.09	48.23	28.55	28.57	45.33	40.28	42.55	31.24	30.01
k, delay calibration	0.04	0.50	0.50	0.04	0.50	0.50	0.06	0.29	0.46	0.23	0.23
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.44	2.61	5.41	5.37	1.40	2.76	6.26	18.86	82.98	1.50	1.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

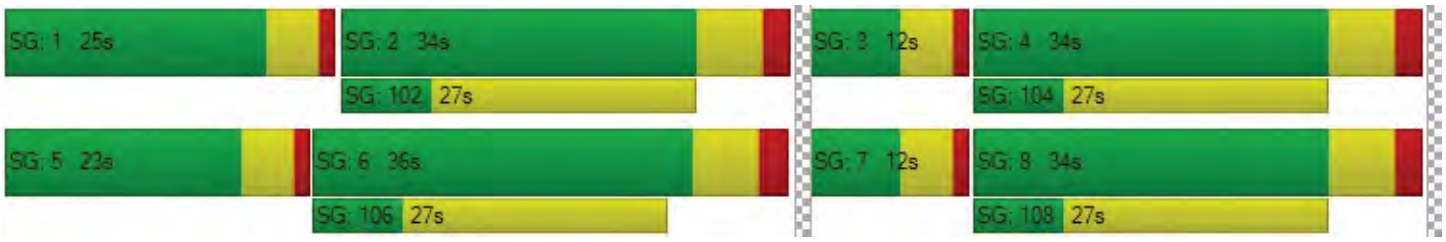
X, volume / capacity	0.68	0.59	0.59	0.81	0.44	0.44	0.86	0.89	1.11	0.46	0.33
d, Delay for Lane Group [s/veh]	52.14	33.67	36.49	53.60	29.95	31.33	51.59	59.14	125.53	32.74	31.05
Lane Group LOS	D	C	D	D	C	C	D	E	F	C	C
Critical Lane Group	no	no	yes	yes	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	1.58	6.13	6.29	2.39	4.44	4.74	4.43	9.01	14.46	4.52	2.67
50th-Percentile Queue Length [ft]	39.50	153.28	157.18	59.69	111.03	118.61	110.66	225.23	361.55	112.90	66.78
95th-Percentile Queue Length [veh]	2.84	10.19	10.40	4.30	7.90	8.32	7.88	13.93	21.82	8.00	4.81
95th-Percentile Queue Length [ft]	71.09	254.80	259.99	107.45	197.44	207.91	196.92	348.29	545.48	200.03	120.20

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	52.14	34.20	36.49	53.60	30.36	31.33	51.59	59.14	59.14	125.53	32.74	31.05
Movement LOS	D	C	D	D	C	C	D	E	E	F	C	C
d_A, Approach Delay [s/veh]	35.76			33.13			56.46			77.93		
Approach LOS	D			C			E			E		
d_I, Intersection Delay [s/veh]	48.75											
Intersection LOS	D											
Intersection V/C	0.633											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	2265	719	909	1248	0	0	0	0	277	2	494
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0.0	182.7	182.7	184.5	175.9	0.0				179.2	182.4	182.7
Adj Flow Rate, veh/h	0	2335	741	937	1287	0				191	0	612
Adj No. of Lanes	0	2	1	2	2	0				1	0	2
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	4	4	3	8	0				6	0	4
Cap, veh/h	0	1198	536	1013	2284	0				368	0	665
Arrive On Green	0.00	0.35	0.35	0.20	0.46	0.00				0.22	0.00	0.22
Sat Flow, veh/h	0	3563	1553	3408	3431	0				1707	0	3084
Grp Volume(v), veh/h	0	2335	741	937	1287	0				191	0	612
Grp Sat Flow(s),veh/h/ln	0	1736	1553	1704	1671	0				1707	0	1542
Q Serve(g_s), s	0.0	37.6	37.6	29.4	30.7	0.0				10.8	0.0	21.2
Cycle Q Clear(g_c), s	0.0	37.6	37.6	29.4	30.7	0.0				10.8	0.0	21.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1198	536	1013	2284	0				368	0	665
V/C Ratio(X)	0.00	1.95	1.38	0.93	0.56	0.00				0.52	0.00	0.92
Avail Cap(c_a), veh/h	0	1198	536	1110	2284	0				384	0	693
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	35.7	35.7	42.5	17.7	0.0				37.8	0.0	41.8
Incr Delay (d2), s/veh	0.0	430.4	183.7	1.4	0.1	0.0				0.4	0.0	16.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	89.6	43.4	14.0	14.1	0.0				5.1	0.0	10.6
LnGrp Delay(d),s/veh	0.0	466.1	219.4	43.8	17.8	0.0				38.2	0.0	58.5
LnGrp LOS		F	F	D	B					D		E
Approach Vol, veh/h		3076			2224						803	
Approach Delay, s/veh		406.7			28.7						53.7	
Approach LOS		F			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	36.9	43.1		29.0		80.0		
Change Period (Y+Rc), s	4.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	35.5	34.5		24.5		74.5		
Max Q Clear Time (g_c+I1), s	31.4	39.6		23.2		32.7		
Green Ext Time (p_c), s	1.0	0.0		0.3		33.9		

Intersection Summary	
HCM 2010 Ctrl Delay	222.5
HCM 2010 LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	363	2179	0	0	1751	722	433	5	415	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	182.7	179.2	0.0	0.0	181.0	182.7	174.3	177.8	181.0			
Adj Flow Rate, veh/h	390	2343	0	0	1883	776	607	0	299			
Adj No. of Lanes	2	2	0	0	2	1	2	0	1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	4	6	0	0	5	4	9	0	5			
Cap, veh/h	479	2307	0	0	1700	766	740	0	343			
Arrive On Green	0.14	0.68	0.00	0.00	0.49	0.49	0.22	0.00	0.22			
Sat Flow, veh/h	3375	3495	0	0	3529	1548	3320	0	1538			
Grp Volume(v), veh/h	390	2343	0	0	1883	776	607	0	299			
Grp Sat Flow(s),veh/h/ln	1688	1703	0	0	1719	1548	1660	0	1538			
Q Serve(g_s), s	12.3	74.5	0.0	0.0	54.4	54.4	19.1	0.0	20.6			
Cycle Q Clear(g_c), s	12.3	74.5	0.0	0.0	54.4	54.4	19.1	0.0	20.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	479	2307	0	0	1700	766	740	0	343			
V/C Ratio(X)	0.82	1.02	0.00	0.00	1.11	1.01	0.82	0.00	0.87			
Avail Cap(c_a), veh/h	1089	2307	0	0	1700	766	740	0	343			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.09	0.09	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	45.8	17.7	0.0	0.0	27.8	27.8	40.7	0.0	41.2			
Incr Delay (d2), s/veh	0.3	10.2	0.0	0.0	57.5	35.9	9.9	0.0	25.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.8	37.6	0.0	0.0	39.3	30.8	9.8	0.0	11.1			
LnGrp Delay(d),s/veh	46.1	28.0	0.0	0.0	85.3	63.7	50.6	0.0	66.3			
LnGrp LOS	D	F			F	F	D		E			
Approach Vol, veh/h		2733			2659			906				
Approach Delay, s/veh		30.6			79.0			55.8				
Approach LOS		C			E			E				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		80.0			20.1	59.9		30.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.5
Max Green Setting (Gmax), s		74.5			35.5	34.5		24.5
Max Q Clear Time (g_c+I1), s		76.5			14.3	56.4		22.6
Green Ext Time (p_c), s		0.0			1.3	0.0		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	54.6
HCM 2010 LOS	D

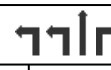
Notes

User approved volume balancing among the lanes for turning movement.

Intersection Level Of Service Report
#89: Pats Ranch Road / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	120.2
Analysis Method:	HCM2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.995

Intersection Setup

Name	Pats Ranch Road						Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	170.00	100.00	100.00
Speed [mph]	35.00			50.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			no			no			yes		

Volumes

Name	Pats Ranch Road						Limonite Avenue			Limonite Avenue		
Base Volume Input [veh/h]	671	50	283	17	50	104	70	1189	197	359	1698	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	35	0	0	0	0	0	42	0	0	0
Total Hourly Volume [veh/h]	671	50	248	17	50	104	70	1189	155	359	1698	20
Peak Hour Factor	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	182	14	67	5	14	28	19	323	42	97	461	5
Total Analysis Volume [veh/h]	729	54	269	18	54	113	76	1291	168	390	1844	22
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	115
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	6	0	5	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	4.7	0.0	3.2	4.7	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	27	34	0	9	16	0	10	44	0	28	62	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	1.5	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	11	0	0	0	0
Pedestrian Clearance [s]	0	20	0	0	0	0	0	13	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	3.7	0.0	2.2	3.7	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	no		no	no		no	yes		no	yes	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	5.70	5.70	4.20	5.70	5.70
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	3.70	3.70	2.20	3.70	3.70
g_i, Effective Green Time [s]	23	33	33	2	12	6	38	38	24	56	56
g / C, Green / Cycle	0.20	0.28	0.28	0.02	0.10	0.05	0.33	0.33	0.21	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.24	0.03	0.19	0.01	0.11	0.05	0.40	0.12	0.24	0.58	0.02
s, saturation flow rate [veh/h]	3101	1676	1425	1597	1498	1597	3192	1425	1597	3192	1425
c, Capacity [veh/h]	620	476	405	31	155	84	1066	476	330	1564	698
d1, Uniform Delay [s]	46.02	30.47	36.34	55.93	51.57	54.22	38.32	28.94	45.62	29.34	15.20
k, delay calibration	0.14	0.11	0.21	0.11	0.44	0.25	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	84.01	0.10	3.56	15.75	89.44	48.54	104.03	2.05	107.87	87.51	0.08
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

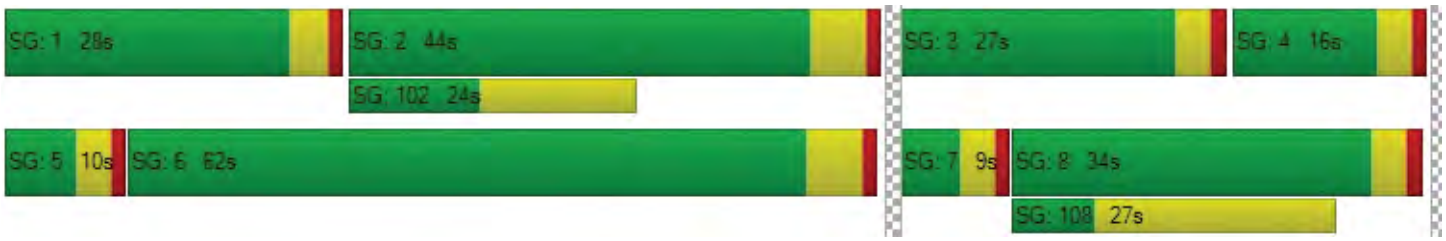
X, volume / capacity	1.18	0.11	0.66	0.58	1.08	0.91	1.21	0.35	1.18	1.18	0.03
d, Delay for Lane Group [s/veh]	130.03	30.57	39.90	71.68	141.00	102.75	142.34	30.99	153.49	116.85	15.28
Lane Group LOS	F	C	D	E	F	F	F	C	F	F	B
Critical Lane Group	yes	no	no	no	yes	no	yes	no	yes	no	no
50th-Percentile Queue Length [veh]	15.94	1.12	6.95	0.64	8.15	3.26	29.58	3.65	18.98	38.54	0.30
50th-Percentile Queue Length [ft]	398.51	27.89	173.69	15.94	203.73	81.58	739.43	91.19	474.39	963.45	7.52
95th-Percentile Queue Length [veh]	24.36	2.01	11.27	1.15	13.20	5.87	43.29	6.57	28.43	54.91	0.54
95th-Percentile Queue Length [ft]	609.03	50.20	281.76	28.70	330.07	146.84	1082.34	164.15	710.64	1372.73	13.54

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	130.03	30.57	39.90	71.68	141.00	141.00	102.75	142.34	30.99	153.49	116.85	15.28
Movement LOS	F	C	D	E	F	F	F	F	C	F	F	B
d_A, Approach Delay [s/veh]	101.88			134.26			128.20			122.19		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	120.22											
Intersection LOS	F											
Intersection V/C	0.995											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
#90: Pats Ranch Road / 65th Street

Control Type:	Signalized	Delay (sec / veh):	19.3
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.306

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	90.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Base Volume Input [veh/h]	85	582	58	14	230	17	89	10	50	63	12	64
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	3	0	0	0	0	0	16	0	0	24
Total Hourly Volume [veh/h]	85	582	55	14	230	17	89	10	34	63	12	40
Peak Hour Factor	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	177	17	4	70	5	27	3	10	19	4	12
Total Analysis Volume [veh/h]	103	706	67	17	279	21	108	12	41	76	15	49
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	0	1	6	0	0	4	0	0	8	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.6	3.6	0.0	3.6	3.6	0.0	0.0	3.6	0.0	0.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	16	27	0	16	27	0	0	27	0	0	27	0
Vehicle Extension [s]	2.5	2.5	0.0	2.5	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	15	0	0	15	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.6	2.6	0.0	2.6	2.6	0.0	0.0	2.6	0.0	0.0	2.6	0.0
Minimum Recall	no	no		no	no			no			no	
Maximum Recall	no	yes		no	yes			no			no	
Pedestrian Recall	no	no		no	no			no			no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	6	44	44	2	40	40	11	11	11	11
g / C, Green / Cycle	0.09	0.62	0.62	0.03	0.56	0.56	0.15	0.15	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.06	0.18	0.18	0.01	0.09	0.01	0.09	0.04	0.12	0.03
s, saturation flow rate [veh/h]	1597	1676	1611	1597	3192	1425	1253	1475	783	1425
c, Capacity [veh/h]	138	1043	1002	45	1800	804	103	225	214	217
d1, Uniform Delay [s]	31.21	6.08	6.08	33.40	7.29	6.75	34.97	26.05	30.48	26.01
k, delay calibration	0.08	0.50	0.50	0.08	0.50	0.50	0.08	0.08	0.08	0.08
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.90	0.70	0.73	3.92	0.18	0.06	48.61	0.39	0.99	0.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.75	0.29	0.29	0.38	0.16	0.03	1.05	0.24	0.43	0.23
d, Delay for Lane Group [s/veh]	37.11	6.78	6.81	37.31	7.47	6.81	83.58	26.45	31.48	26.40
Lane Group LOS	D	A	A	D	A	A	F	C	C	C
Critical Lane Group	no	no	yes	yes	no	no	no	no	yes	no
50th-Percentile Queue Length [veh]	1.84	1.74	1.68	0.32	0.86	0.13	3.12	0.79	1.53	0.73
50th-Percentile Queue Length [ft]	45.96	43.62	42.12	7.99	21.57	3.18	78.04	19.63	38.16	18.13
95th-Percentile Queue Length [veh]	3.31	3.14	3.03	0.58	1.55	0.23	5.62	1.41	2.75	1.31
95th-Percentile Queue Length [ft]	82.73	78.52	75.82	14.39	38.83	5.73	140.47	35.34	68.69	32.64

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	37.11	6.79	6.81	37.31	7.47	6.81	83.58	26.45	26.45	31.48	31.48	26.40
Movement LOS	D	A	A	D	A	A	F	C	C	C	C	C
d_A, Approach Delay [s/veh]	11.30			9.03			64.77			29.70		
Approach LOS	B			A			E			C		
d_I, Intersection Delay [s/veh]	19.29											
Intersection LOS	B											
Intersection V/C	0.306											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection	
Int Delay, s/veh	4.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	139	164	561	93	64	279
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	204	241	825	137	94	410

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1286	481	0	0	962	0
Stage 1	893	-	-	-	-	-
Stage 2	393	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	236	*878	-	-	887	-
Stage 1	533	-	-	-	-	-
Stage 2	657	-	-	-	-	-
Platoon blocked, %	1	1	-	-	1	-
Mov Cap-1 Maneuver	211	*878	-	-	887	-
Mov Cap-2 Maneuver	351	-	-	-	-	-
Stage 1	533	-	-	-	-	-
Stage 2	587	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.9	0	1.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	351	878	887	-
HCM Lane V/C Ratio	-	-	0.582	0.275	0.106	-
HCM Control Delay (s)	-	-	28.6	10.6	9.5	-
HCM Lane LOS	-	-	D	B	A	-
HCM 95th %tile Q(veh)	-	-	3.5	1.1	0.4	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection Level Of Service Report
#93: Pats Ranch Road / 68th Street

Control Type:	All-way stop	Delay (sec / veh):	441.8
Analysis Method:	HCM2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name				Pats Ranch Road			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	220.00
Speed [mph]	25.00			35.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			yes			no			no		

Volumes

Name				Pats Ranch Road			68th Street			68th Street		
Base Volume Input [veh/h]	50	82	13	58	28	333	484	786	17	5	732	88
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	82	13	58	28	333	484	786	17	5	732	88
Peak Hour Factor	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	28	4	20	9	113	164	266	6	2	248	30
Total Analysis Volume [veh/h]	68	111	18	78	38	451	655	1064	23	7	991	119
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.89	2.02	0.98	0.40	21.41	44.17	94.82	0.06	24.77	24.77	1.30
95th-Percentile Queue Length [ft]	22.19	50.42	24.54	9.93	535.25	1104.26	2370.41	1.57	619.3	619.3	32.50
Approach Delay [s/veh]	21.50		154.79			741.19		194.80			
Approach LOS	C		F			F		F			
Intersection Delay [s/veh]	441.83										
Intersection LOS	F										

Intersection Level Of Service Report
#94: Wineville Avenue / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	77.2
Analysis Method:	HCM2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.920

Intersection Setup

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Pocket Length [ft]	185.00	100.00	100.00	100.00	100.00	100.00	250.00	100.00	360.00	245.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Base Volume Input [veh/h]	88	126	60	86	91	300	177	1244	68	33	1689	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	24	0	0	0
Total Hourly Volume [veh/h]	88	126	60	86	91	300	177	1244	44	33	1689	59
Peak Hour Factor	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	34	16	23	24	80	47	332	12	9	450	16
Total Analysis Volume [veh/h]	94	134	64	92	97	320	189	1326	47	35	1801	63
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	26.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	5	0	4	5	0	4	6	0	4	6	0
Maximum Green [s]	37	58	0	37	58	0	20	0	0	75	0	0
Amber [s]	3.0	4.3	0.0	3.0	4.3	0.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0
Split [s]	11	32	0	13	34	0	16	58	0	17	59	0
Vehicle Extension [s]	1.5	2.0	0.0	1.5	2.0	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Walk [s]	0	5	0	0	5	0	0	10	0	0	10	0
Pedestrian Clearance [s]	0	21	0	0	16	0	0	13	0	0	12	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	1.5	3.3	0.0	1.5	3.3	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	no		no	no		no	yes		no	yes	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	L	C	R	L	C	C
L, Total Lost Time per Cycle [s]	3.50	5.30	5.30	3.50	5.30	3.50	6.00	6.00	3.50	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.50	3.30	3.30	1.50	3.30	1.50	4.00	4.00	1.50	4.00	4.00
g_i, Effective Green Time [s]	8	28	28	8	29	13	63	63	3	53	53
g / C, Green / Cycle	0.06	0.24	0.24	0.06	0.24	0.10	0.52	0.52	0.03	0.44	0.44
(v / s)_i Volume / Saturation Flow Rate	0.05	0.05	0.06	0.05	0.25	0.11	0.37	0.03	0.02	0.50	0.51
s, saturation flow rate [veh/h]	1774	1863	1667	1774	1641	1774	3547	1583	1774	1863	1841
c, Capacity [veh/h]	111	439	393	115	390	185	1851	826	45	825	815
d1, Uniform Delay [s]	55.69	37.09	37.21	55.35	45.73	53.76	21.91	14.14	58.17	33.43	33.43
k, delay calibration	0.23	0.04	0.04	0.10	0.46	0.42	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	29.07	0.10	0.12	11.22	63.04	66.71	2.41	0.13	10.54	73.67	78.55
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

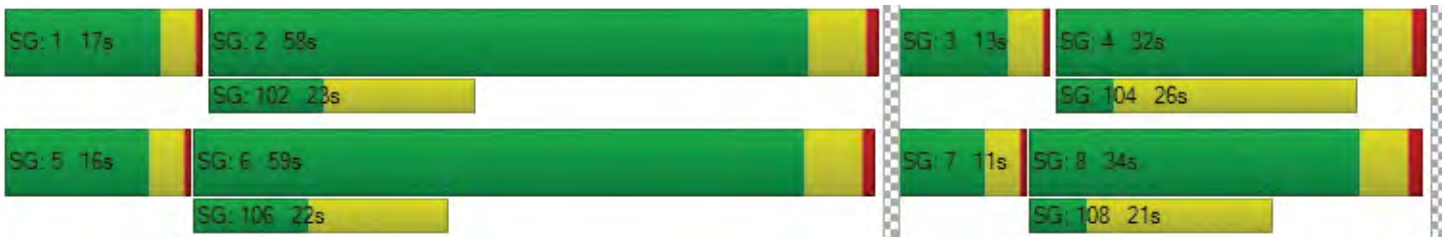
X, volume / capacity	0.85	0.23	0.24	0.80	1.07	1.02	0.72	0.06	0.78	1.13	1.14
d, Delay for Lane Group [s/veh]	84.75	37.19	37.33	66.57	108.77	120.47	24.32	14.27	68.71	107.10	111.98
Lane Group LOS	F	D	D	E	F	F	C	B	E	F	F
Critical Lane Group	yes	no	no	no	yes	yes	no	no	no	no	yes
50th-Percentile Queue Length [veh]	3.64	2.37	2.25	3.04	18.01	8.85	13.74	0.63	1.15	38.46	39.11
50th-Percentile Queue Length [ft]	91.10	59.30	56.16	75.94	450.17	221.23	343.47	15.76	28.69	961.57	977.86
95th-Percentile Queue Length [veh]	6.56	4.27	4.04	5.47	25.94	13.85	19.82	1.13	2.07	53.19	54.38
95th-Percentile Queue Length [ft]	163.98	106.73	101.08	136.69	648.43	346.35	495.44	28.36	51.64	1329.66	1359.41

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	84.75	37.22	37.33	66.57	108.77	108.77	120.47	24.32	14.27	68.71	109.45	111.98
Movement LOS	F	D	D	E	F	F	F	C	B	E	F	F
d_A, Approach Delay [s/veh]	52.55			101.15			35.65			108.78		
Approach LOS	D			F			D			F		
d_I, Intersection Delay [s/veh]	77.21											
Intersection LOS	E											
Intersection V/C	0.920											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
#86: Hamner Avenue / 68th Street

Control Type:	Signalized	Delay (sec / veh):	47.8
Analysis Method:	HCM2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.631

Intersection Setup

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	280.00	100.00	100.00	250.00	100.00	100.00	200.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Base Volume Input [veh/h]	60	1325	267	87	867	122	84	107	58	285	168	175
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	72	0	0	16	0	0	10	0	0	38
Total Hourly Volume [veh/h]	60	1325	195	87	867	106	84	107	48	285	168	137
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	360	53	24	236	29	23	29	13	77	46	37
Total Analysis Volume [veh/h]	65	1440	212	95	942	115	91	116	52	310	183	149
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0
All red [s]	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Split [s]	12	34	0	12	34	0	17	34	0	20	37	0
Vehicle Extension [s]	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	L	C	R
L, Total Lost Time per Cycle [s]	5.00	7.00	7.00	5.00	7.00	7.00	5.00	7.00	5.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	5.00	5.00	3.00	5.00	5.00	3.00	5.00	3.00	5.00	5.00
g_i, Effective Green Time [s]	6	41	41	7	42	42	7	13	15	21	21
g / C, Green / Cycle	0.06	0.41	0.41	0.07	0.42	0.42	0.07	0.13	0.15	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.04	0.27	0.27	0.06	0.18	0.18	0.06	0.11	0.19	0.11	0.10
s, saturation flow rate [veh/h]	1597	3192	1539	1597	3192	1565	1597	1590	1597	1676	1425
c, Capacity [veh/h]	93	1308	630	116	1354	664	112	205	237	348	295
d1, Uniform Delay [s]	46.18	23.88	23.91	45.66	20.22	20.23	45.84	42.41	42.55	35.24	35.06
k, delay calibration	0.04	0.50	0.50	0.04	0.50	0.50	0.04	0.23	0.50	0.23	0.23
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.48	2.65	5.43	5.16	0.99	2.01	5.36	15.60	165.71	2.63	2.83
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

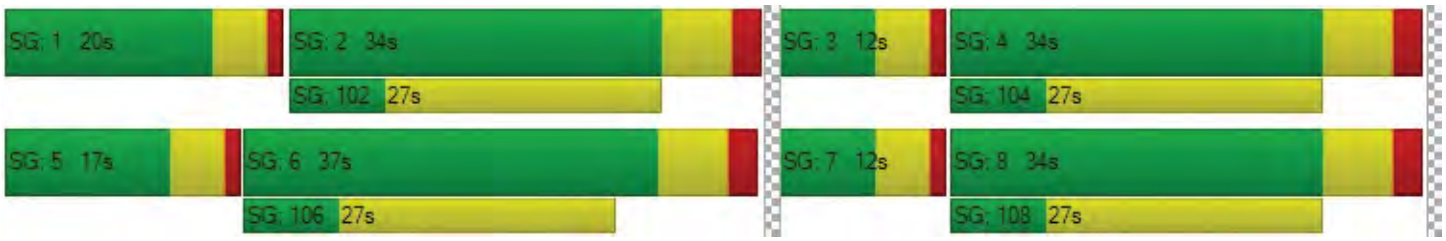
X, volume / capacity	0.70	0.66	0.66	0.82	0.43	0.43	0.82	0.82	1.31	0.53	0.50
d, Delay for Lane Group [s/veh]	49.67	26.53	29.34	50.81	21.21	22.25	51.20	58.01	208.25	37.87	37.89
Lane Group LOS	D	C	C	D	C	C	D	E	F	D	D
Critical Lane Group	no	no	yes	yes	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	1.62	8.11	8.33	2.41	4.58	4.69	2.31	4.76	16.49	4.04	3.30
50th-Percentile Queue Length [ft]	40.50	202.78	208.36	60.16	114.47	117.35	57.85	119.02	412.21	100.96	82.45
95th-Percentile Queue Length [veh]	2.92	12.78	13.07	4.33	8.09	8.25	4.17	8.34	25.88	7.27	5.94
95th-Percentile Queue Length [ft]	72.91	319.55	326.72	108.29	202.20	206.18	104.13	208.48	647.10	181.74	148.41

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	49.67	27.07	29.34	50.81	21.44	22.25	51.20	58.01	58.01	208.25	37.87	37.89
Movement LOS	D	C	C	D	C	C	D	E	E	F	D	D
d_A, Approach Delay [s/veh]	28.52			24.45			55.62			120.15		
Approach LOS	C			C			E			F		
d_I, Intersection Delay [s/veh]	47.84											
Intersection LOS	D											
Intersection V/C	0.631											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
#90: Pats Ranch Road / 65th Street

Control Type:	Signalized	Delay (sec / veh):	14.9
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.358

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	90.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Base Volume Input [veh/h]	98	461	45	66	454	47	50	4	47	35	14	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	18	0	0	18
Total Hourly Volume [veh/h]	98	461	45	66	454	47	50	4	29	35	14	23
Peak Hour Factor	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	153	15	22	151	16	17	1	10	12	5	8
Total Analysis Volume [veh/h]	130	612	60	88	603	62	66	5	39	46	19	31
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	0	1	6	0	0	4	0	0	8	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.6	3.6	0.0	3.6	3.6	0.0	0.0	3.6	0.0	0.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	12	27	0	12	27	0	0	31	0	0	31	0
Vehicle Extension [s]	2.5	2.5	0.0	2.5	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	15	0	0	15	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.6	2.6	0.0	2.6	2.6	0.0	0.0	2.6	0.0	0.0	2.6	0.0
Minimum Recall	no	no		no	no			no			no	
Maximum Recall	no	yes		no	yes			no			no	
Pedestrian Recall	no	no		no	no			no			no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	7	43	43	6	42	42	7	7	7	7
g / C, Green / Cycle	0.10	0.61	0.61	0.08	0.60	0.60	0.11	0.11	0.11	0.11
(v / s)_i Volume / Saturation Flow Rate	0.08	0.16	0.16	0.06	0.19	0.04	0.05	0.03	0.09	0.02
s, saturation flow rate [veh/h]	1597	1676	1612	1597	3192	1425	1249	1450	742	1425
c, Capacity [veh/h]	158	1032	992	130	1910	853	103	153	166	150
d1, Uniform Delay [s]	30.89	6.18	6.18	31.20	6.95	5.90	34.95	28.84	31.53	28.59
k, delay calibration	0.14	0.50	0.50	0.08	0.50	0.50	0.08	0.08	0.08	0.08
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	12.69	0.63	0.66	4.50	0.43	0.17	4.81	0.76	1.11	0.50
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

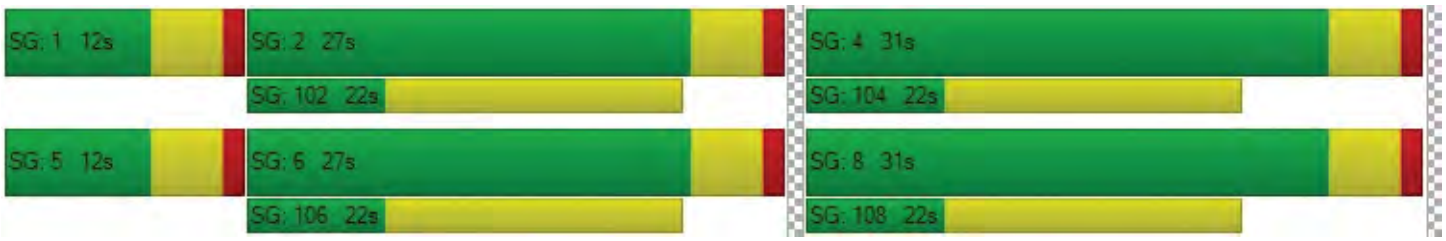
X, volume / capacity	0.82	0.27	0.27	0.68	0.32	0.07	0.64	0.29	0.39	0.21
d, Delay for Lane Group [s/veh]	43.59	6.81	6.84	35.70	7.39	6.06	39.76	29.60	32.64	29.09
Lane Group LOS	D	A	A	D	A	A	D	C	C	C
Critical Lane Group	yes	no	no	no	yes	no	no	no	yes	no
50th-Percentile Queue Length [veh]	2.59	1.62	1.57	1.53	1.87	0.34	1.28	0.70	1.12	0.49
50th-Percentile Queue Length [ft]	64.82	40.49	39.17	38.36	46.69	8.62	32.10	17.49	27.96	12.17
95th-Percentile Queue Length [veh]	4.67	2.92	2.82	2.76	3.36	0.62	2.31	1.26	2.01	0.88
95th-Percentile Queue Length [ft]	116.68	72.89	70.50	69.06	84.04	15.51	57.79	31.49	50.32	21.91

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	43.59	6.82	6.84	35.70	7.39	6.06	39.76	29.60	29.60	32.64	32.64	29.09
Movement LOS	D	A	A	D	A	A	D	C	C	C	C	C
d_A, Approach Delay [s/veh]	13.96			10.59			35.70			31.49		
Approach LOS	B			B			D			C		
d_I, Intersection Delay [s/veh]	14.90											
Intersection LOS	B											
Intersection V/C	0.358											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection	
Int Delay, s/veh	4.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	125	203	402	123	99	437
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	100	-
Veh in Median Storage, #	2	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	66	66	66	66	66	66
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	189	308	609	186	150	662

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1333	398	0	0	795	0
Stage 1	702	-	-	-	-	-
Stage 2	631	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	194	*930	-	-	984	-
Stage 1	619	-	-	-	-	-
Stage 2	498	-	-	-	-	-
Platoon blocked, %	1	1	-	-	1	-
Mov Cap-1 Maneuver	~ 164	*930	-	-	984	-
Mov Cap-2 Maneuver	359	-	-	-	-	-
Stage 1	619	-	-	-	-	-
Stage 2	422	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.5	0	1.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	359	930	984	-
HCM Lane V/C Ratio	-	-	0.528	0.331	0.152	-
HCM Control Delay (s)	-	-	25.7	10.8	9.3	-
HCM Lane LOS	-	-	D	B	A	-
HCM 95th %tile Q(veh)	-	-	2.9	1.5	0.5	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Two Way Analysis cannot be performed on Signalized Intersection.

Intersection Level Of Service Report
#93: Pats Ranch Road / 68th Street

Control Type:	All-way stop	Delay (sec / veh):	325.9
Analysis Method:	HCM2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name				Pats Ranch Road			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	220.00
Speed [mph]	25.00			35.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			yes			no			no		

Volumes

Name				Pats Ranch Road			68th Street			68th Street		
Base Volume Input [veh/h]	33	54	9	163	93	399	341	493	57	15	599	183
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	54	9	163	93	399	341	493	57	15	599	183
Peak Hour Factor	0.6780	0.6780	0.6780	0.6780	1.0000	0.6780	0.6780	0.6780	1.0000	1.0000	0.6780	0.6780
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	20	3	60	23	147	126	182	14	4	221	67
Total Analysis Volume [veh/h]	49	80	13	240	93	588	503	727	57	15	883	270
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.64	1.36	6.90	1.28	39.22	30.76	62.70	0.15	21.13	21.13	5.97
95th-Percentile Queue Length [ft]	15.89	33.93	172.47	31.96	980.42	768.97	1567.47	3.67	528.2	528.2	149.2
Approach Delay [s/veh]	20.22		281.98			547.02		154.05			
Approach LOS	C		F			F		F			
Intersection Delay [s/veh]	325.90										
Intersection LOS	F										

Intersection Level Of Service Report
#86: Hamner Avenue / 68th Street

Control Type:	Signalized	Delay (sec / veh):	49.6
Analysis Method:	HCM2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.684

Intersection Setup

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	280.00	100.00	100.00	250.00	100.00	100.00	200.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Base Volume Input [veh/h]	85	1335	276	186	906	103	84	125	52	292	151	185
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	77	0	0	34	0	0	11	0	0	38
Total Hourly Volume [veh/h]	85	1335	199	186	906	69	84	125	41	292	151	147
Peak Hour Factor	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	347	52	48	235	18	22	32	11	76	39	38
Total Analysis Volume [veh/h]	88	1386	207	193	941	72	87	130	43	303	157	153
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0
All red [s]	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Split [s]	12	34	0	12	34	0	18	34	0	20	36	0
Vehicle Extension [s]	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	L	C	R
L, Total Lost Time per Cycle [s]	5.00	7.00	7.00	5.00	7.00	7.00	5.00	7.00	5.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	5.00	5.00	3.00	5.00	5.00	3.00	5.00	3.00	5.00	5.00
g_i, Effective Green Time [s]	7	34	34	14	41	41	7	13	15	21	21
g / C, Green / Cycle	0.07	0.34	0.34	0.14	0.41	0.41	0.07	0.13	0.15	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.06	0.27	0.27	0.12	0.19	0.19	0.05	0.11	0.19	0.09	0.11
s, saturation flow rate [veh/h]	1597	3192	1539	1597	3192	1609	1597	1606	1597	1676	1425
c, Capacity [veh/h]	109	1090	526	219	1312	661	107	211	239	358	305
d1, Uniform Delay [s]	45.95	29.50	29.52	42.31	21.37	21.38	46.00	42.27	42.51	34.10	34.62
k, delay calibration	0.04	0.50	0.50	0.04	0.50	0.50	0.04	0.23	0.50	0.23	0.23
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.31	5.46	10.86	4.84	1.16	2.29	5.41	15.16	149.60	1.80	2.73
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

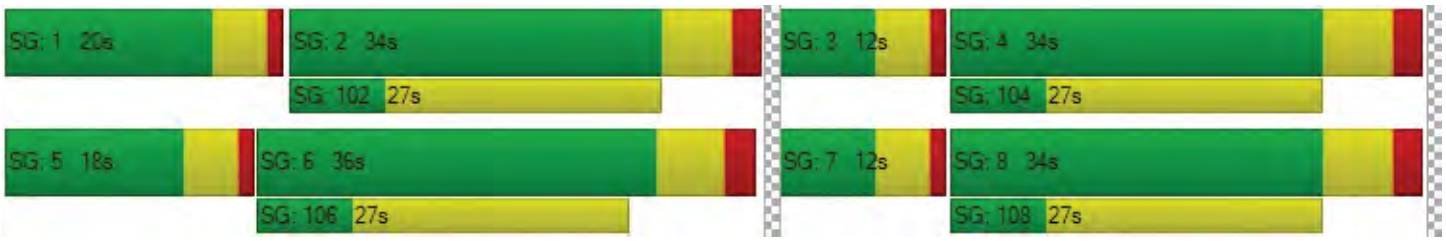
X, volume / capacity	0.81	0.78	0.78	0.88	0.46	0.46	0.81	0.82	1.27	0.44	0.50
d, Delay for Lane Group [s/veh]	51.26	34.96	40.38	47.15	22.53	23.66	51.41	57.43	192.11	35.90	37.35
Lane Group LOS	D	C	D	D	C	C	D	E	F	D	D
Critical Lane Group	no	no	yes	yes	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	2.24	9.33	9.81	4.77	4.95	5.21	2.22	4.87	15.56	3.34	3.36
50th-Percentile Queue Length [ft]	55.98	233.26	245.18	119.22	123.83	130.23	55.42	121.86	388.93	83.59	84.05
95th-Percentile Queue Length [veh]	4.03	14.34	14.94	8.35	8.60	8.95	3.99	8.50	24.36	6.02	6.05
95th-Percentile Queue Length [ft]	100.76	358.50	373.58	208.75	215.08	223.80	99.76	212.38	609.01	150.46	151.28

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.26	36.00	40.38	47.15	22.84	23.66	51.41	57.43	57.43	192.11	35.90	37.35
Movement LOS	D	D	D	D	C	C	D	E	E	F	D	D
d_A, Approach Delay [s/veh]	37.68			27.17			55.42			113.48		
Approach LOS	D			C			E			F		
d_I, Intersection Delay [s/veh]	49.60											
Intersection LOS	D											
Intersection V/C	0.684											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1898	379	707	2276	0	0	0	0	518	0	628
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0.0	186.3	186.3	188.1	186.3	0.0				186.3	186.3	186.3
Adj Flow Rate, veh/h	0	1998	399	744	2396	0				769	0	421
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	1	2	0				2	0	2
Cap, veh/h	0	1414	633	823	2397	0				790	0	350
Arrive On Green	0.00	0.40	0.40	0.24	0.68	0.00				0.22	0.00	0.22
Sat Flow, veh/h	0	3632	1583	3476	3632	0				3548	0	1573
Grp Volume(v), veh/h	0	1998	399	744	2396	0				769	0	421
Grp Sat Flow(s),veh/h/ln	0	1770	1583	1738	1770	0				1774	0	1573
Q Serve(g_s), s	0.0	44.0	22.3	22.9	74.4	0.0				23.7	0.0	24.5
Cycle Q Clear(g_c), s	0.0	44.0	22.3	22.9	74.4	0.0				23.7	0.0	24.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1414	633	823	2397	0				790	0	350
V/C Ratio(X)	0.00	1.41	0.63	0.90	1.00	0.00				0.97	0.00	1.20
Avail Cap(c_a), veh/h	0	1414	633	1122	2397	0				790	0	350
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	33.0	26.5	40.8	17.7	0.0				42.4	0.0	42.8
Incr Delay (d2), s/veh	0.0	190.0	1.5	0.7	5.4	0.0				25.3	0.0	115.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	58.7	10.0	11.0	37.4	0.0				14.3	0.0	21.8
LnGrp Delay(d),s/veh	0.0	223.0	28.0	41.5	23.2	0.0				67.8	0.0	157.8
LnGrp LOS		F	C	D	C					E		F
Approach Vol, veh/h		2397			3140						1190	
Approach Delay, s/veh		190.6			27.5						99.6	
Approach LOS		F			C						F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	30.5	49.5		30.0		80.0		
Change Period (Y+Rc), s	4.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	35.5	34.5		24.5		74.5		
Max Q Clear Time (g_c+I1), s	24.9	46.0		26.5		76.4		
Green Ext Time (p_c), s	1.2	0.0		0.0		0.0		

Intersection Summary	
HCM 2010 Ctrl Delay	98.4
HCM 2010 LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	192	2244	0	0	2501	447	537	1	995	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	184.5	186.3	0.0	0.0	188.1	188.1	186.3	187.9	188.1			
Adj Flow Rate, veh/h	200	2338	0	0	2605	466	373	0	1236			
Adj No. of Lanes	2	2	0	0	2	1	1	0	2			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	2	0	0	1	1	2	0	1			
Cap, veh/h	276	2397	0	0	1985	886	395	0	712			
Arrive On Green	0.08	0.68	0.00	0.00	0.56	0.56	0.22	0.00	0.22			
Sat Flow, veh/h	3408	3632	0	0	3668	1595	1774	0	3198			
Grp Volume(v), veh/h	200	2338	0	0	2605	466	373	0	1236			
Grp Sat Flow(s),veh/h/ln	1704	1770	0	0	1787	1595	1774	0	1599			
Q Serve(g_s), s	6.3	69.1	0.0	0.0	61.1	20.2	22.8	0.0	24.5			
Cycle Q Clear(g_c), s	6.3	69.1	0.0	0.0	61.1	20.2	22.8	0.0	24.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	276	2397	0	0	1985	886	395	0	712			
V/C Ratio(X)	0.72	0.98	0.00	0.00	1.31	0.53	0.94	0.00	1.74			
Avail Cap(c_a), veh/h	1100	2397	0	0	1985	886	395	0	712			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.09	0.09	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	49.4	16.9	0.0	0.0	24.5	15.4	42.1	0.0	42.8			
Incr Delay (d2), s/veh	0.3	2.2	0.0	0.0	144.2	2.2	33.2	0.0	336.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.0	33.9	0.0	0.0	69.5	9.4	14.7	0.0	44.1			
LnGrp Delay(d),s/veh	49.7	19.1	0.0	0.0	168.7	17.6	75.2	0.0	379.5			
LnGrp LOS	D	B			F	B	E		F			
Approach Vol, veh/h		2538			3071			1609				
Approach Delay, s/veh		21.5			145.7			308.9				
Approach LOS		C			F			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		80.0			13.4	66.6		30.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.5
Max Green Setting (Gmax), s		74.5			35.5	34.5		24.5
Max Q Clear Time (g_c+I1), s		71.1			8.3	63.1		26.5
Green Ext Time (p_c), s		3.4			0.6	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	138.4
HCM 2010 LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

Intersection Level Of Service Report
#89: Pats Ranch Road / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	275.5
Analysis Method:	HCM2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.444

Intersection Setup

Name	Pats Ranch Road						Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	170.00	100.00	100.00
Speed [mph]	35.00			50.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			no			no			yes		

Volumes

Name	Pats Ranch Road						Limonite Avenue			Limonite Avenue		
Base Volume Input [veh/h]	589	100	427	50	100	163	110	2316	575	419	2197	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	64	0	0	0	0	0	87	0	0	0
Total Hourly Volume [veh/h]	589	100	363	50	100	163	110	2316	488	419	2197	21
Peak Hour Factor	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	157	27	97	13	27	44	29	619	130	112	587	6
Total Analysis Volume [veh/h]	629	107	388	53	107	174	118	2474	521	448	2347	22
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	6	0	5	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	4.7	0.0	3.2	4.7	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	23	31	0	9	17	0	10	56	0	24	70	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	1.5	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	11	0	0	0	0
Pedestrian Clearance [s]	0	20	0	0	0	0	0	13	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	3.7	0.0	2.2	3.7	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	no		no	no		no	yes		no	yes	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	5.70	5.70	4.20	5.70	5.70
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	3.70	3.70	2.20	3.70	3.70
g_i, Effective Green Time [s]	19	27	27	5	13	6	50	50	20	64	64
g / C, Green / Cycle	0.16	0.22	0.22	0.04	0.11	0.05	0.42	0.42	0.17	0.54	0.54
(v / s)_i Volume / Saturation Flow Rate	0.20	0.06	0.27	0.03	0.19	0.07	0.78	0.37	0.28	0.74	0.02
s, saturation flow rate [veh/h]	3101	1676	1425	1597	1511	1597	3192	1425	1597	3192	1425
c, Capacity [veh/h]	491	375	319	66	162	80	1342	599	264	1713	765
d1, Uniform Delay [s]	50.51	38.61	46.58	57.03	53.60	56.99	34.79	31.79	50.11	27.80	13.08
k, delay calibration	0.17	0.11	0.50	0.16	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	131.54	0.41	122.41	27.05	356.61	265.77	382.69	15.81	330.50	170.26	0.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.28	0.29	1.22	0.80	1.74	1.47	1.84	0.87	1.70	1.37	0.03
d, Delay for Lane Group [s/veh]	182.04	39.03	168.99	84.08	410.20	322.77	417.48	47.60	380.60	198.07	13.15
Lane Group LOS	F	D	F	F	F	F	F	D	F	F	B
Critical Lane Group	yes	no	no	no	yes	no	yes	no	yes	no	no
50th-Percentile Queue Length [veh]	16.26	2.64	20.20	2.04	20.71	8.32	89.57	15.59	31.87	62.50	0.28
50th-Percentile Queue Length [ft]	406.48	66.05	504.96	51.05	517.83	207.95	2239.25	389.69	796.67	1562.57	7.01
95th-Percentile Queue Length [veh]	25.44	4.76	30.49	3.68	33.35	14.32	142.13	22.06	50.07	93.44	0.50
95th-Percentile Queue Length [ft]	635.94	118.88	762.34	91.90	833.76	357.98	3553.34	551.57	1251.80	2336.09	12.62

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	182.04	39.03	168.99	84.08	410.20	410.20	322.77	417.48	47.60	380.60	198.07	13.15
Movement LOS	F	D	F	F	F	F	F	F	D	F	F	B
d_A, Approach Delay [s/veh]	163.92			358.45			351.99			225.65		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	275.50											
Intersection LOS	F											
Intersection V/C	1.444											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
#90: Pats Ranch Road / 65th Street

Control Type:	Signalized	Delay (sec / veh):	25.9
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.394

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	90.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Base Volume Input [veh/h]	158	286	20	100	562	75	77	12	53	14	43	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	15	0	0	14
Total Hourly Volume [veh/h]	158	286	20	100	562	75	77	12	38	14	43	23
Peak Hour Factor	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	46	83	6	29	164	22	22	3	11	4	13	7
Total Analysis Volume [veh/h]	184	333	23	116	654	87	90	14	44	16	50	27
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	0	1	6	0	0	4	0	0	8	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.6	3.6	0.0	3.6	3.6	0.0	0.0	3.6	0.0	0.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	12	27	0	12	27	0	0	31	0	0	31	0
Vehicle Extension [s]	2.5	2.5	0.0	2.5	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	15	0	0	15	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.6	2.6	0.0	2.6	2.6	0.0	0.0	2.6	0.0	0.0	2.6	0.0
Minimum Recall	no	no		no	no			no			no	
Maximum Recall	no	yes		no	yes			no			no	
Pedestrian Recall	no	no		no	no			no			no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	7	44	44	6	42	42	6	6	6	6
g / C, Green / Cycle	0.11	0.62	0.62	0.09	0.61	0.61	0.09	0.09	0.09	0.09
(v / s)_i Volume / Saturation Flow Rate	0.12	0.11	0.11	0.07	0.20	0.06	0.07	0.04	0.07	0.02
s, saturation flow rate [veh/h]	1597	1676	1638	1597	3192	1425	1214	1479	951	1425
c, Capacity [veh/h]	168	1046	1022	142	1938	865	104	133	149	128
d1, Uniform Delay [s]	31.22	5.55	5.52	31.24	6.77	5.73	34.89	30.10	30.59	29.48
k, delay calibration	0.34	0.50	0.50	0.09	0.50	0.50	0.08	0.08	0.08	0.08
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	84.35	0.37	0.36	8.84	0.47	0.23	14.70	1.68	1.52	0.60
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.09	0.18	0.17	0.82	0.34	0.10	0.87	0.44	0.44	0.21
d, Delay for Lane Group [s/veh]	115.57	5.91	5.88	40.08	7.24	5.96	49.59	31.78	32.11	30.08
Lane Group LOS	F	A	A	D	A	A	D	C	C	C
Critical Lane Group	yes	no	no	no	yes	no	yes	no	no	no
50th-Percentile Queue Length [veh]	6.62	0.97	0.91	2.17	1.98	0.47	2.01	0.97	1.14	0.43
50th-Percentile Queue Length [ft]	165.48	24.23	22.72	54.28	49.50	11.83	50.36	24.22	28.61	10.87
95th-Percentile Queue Length [veh]	11.20	1.74	1.64	3.91	3.56	0.85	3.63	1.74	2.06	0.78
95th-Percentile Queue Length [ft]	280.10	43.61	40.90	97.70	89.11	21.30	90.65	43.60	51.51	19.57

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	115.57	5.90	5.88	40.08	7.24	5.96	49.59	31.78	31.78	32.11	32.11	30.08
Movement LOS	F	A	A	D	A	A	D	C	C	C	C	C
d_A, Approach Delay [s/veh]	43.26			11.55			42.61			31.52		
Approach LOS	D			B			D			C		
d_I, Intersection Delay [s/veh]	25.95											
Intersection LOS	C											
Intersection V/C	0.394											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	12	35	428	31	53	577
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	42	516	37	64	695

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1009	277	0	0	553	0
Stage 1	534	-	-	-	-	-
Stage 2	475	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	237	720	-	-	1013	-
Stage 1	552	-	-	-	-	-
Stage 2	592	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	222	720	-	-	1013	-
Mov Cap-2 Maneuver	354	-	-	-	-	-
Stage 1	552	-	-	-	-	-
Stage 2	555	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.7	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	354	720	1013	-
HCM Lane V/C Ratio	-	-	0.041	0.059	0.063	-
HCM Control Delay (s)	-	-	15.6	10.3	8.8	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.2	0.2	-

Intersection Level Of Service Report
#93: Pats Ranch Road / 68th Street

Control Type:	All-way stop	Delay (sec / veh):	85.0
Analysis Method:	HCM2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	220.00
Speed [mph]	25.00			35.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			yes			no			no		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			68th Street			68th Street		
Base Volume Input [veh/h]	33	54	9	92	93	403	345	453	57	15	408	60
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	54	9	92	93	403	345	453	57	15	408	60
Peak Hour Factor	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	16	3	27	27	119	102	134	17	4	120	18
Total Analysis Volume [veh/h]	39	64	11	108	110	475	407	534	67	18	481	71
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.36	0.73	1.16	1.11	16.50	11.07	26.63	0.16	4.26	4.26	0.63
95th-Percentile Queue Length [ft]	9.12	18.36	28.90	27.74	412.54	276.74	665.75	3.96	106.4	106.4	15.73
Approach Delay [s/veh]	14.44		76.11			132.74		25.57			
Approach LOS	B		F			F		D			
Intersection Delay [s/veh]	85.02										
Intersection LOS	F										

Intersection Level Of Service Report
#94: Wineville Avenue / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	250.5
Analysis Method:	HCM2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.308

Intersection Setup

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Pocket Length [ft]	185.00	100.00	100.00	100.00	100.00	100.00	250.00	100.00	360.00	245.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Base Volume Input [veh/h]	121	56	43	149	112	421	365	2314	112	69	2094	126
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	32	0	0	0
Total Hourly Volume [veh/h]	121	56	43	149	112	421	365	2314	80	69	2094	126
Peak Hour Factor	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	15	12	40	30	114	99	627	22	19	567	34
Total Analysis Volume [veh/h]	131	61	47	161	121	456	395	2507	87	75	2269	137
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	26.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	5	0	4	5	0	4	6	0	4	6	0
Maximum Green [s]	37	58	0	37	58	0	20	0	0	75	0	0
Amber [s]	3.0	4.3	0.0	3.0	4.3	0.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0
Split [s]	10	32	0	11	33	0	21	63	0	14	56	0
Vehicle Extension [s]	1.5	2.0	0.0	1.5	2.0	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Walk [s]	0	5	0	0	5	0	0	10	0	0	10	0
Pedestrian Clearance [s]	0	21	0	0	16	0	0	13	0	0	12	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	1.5	3.3	0.0	1.5	3.3	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	no		no	no		no	yes		no	yes	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	L	C	R	L	C	C
L, Total Lost Time per Cycle [s]	3.50	5.30	5.30	3.50	5.30	3.50	6.00	6.00	3.50	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.50	3.30	3.30	1.50	3.30	1.50	4.00	4.00	1.50	4.00	4.00
g_i, Effective Green Time [s]	7	27	27	8	28	18	61	61	6	50	50
g / C, Green / Cycle	0.05	0.22	0.22	0.06	0.23	0.15	0.51	0.51	0.05	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.07	0.03	0.03	0.09	0.35	0.22	0.71	0.05	0.04	0.65	0.66
s, saturation flow rate [veh/h]	1774	1863	1607	1774	1635	1774	3547	1583	1774	1863	1826
c, Capacity [veh/h]	96	412	356	111	375	259	1808	807	96	778	763
d1, Uniform Delay [s]	56.75	37.51	37.61	56.25	46.23	51.26	29.42	15.26	56.09	34.94	34.94
k, delay calibration	0.50	0.04	0.04	0.50	0.50	0.50	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	215.95	0.05	0.07	245.95	254.63	255.81	177.45	0.27	5.23	251.94	265.83
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.36	0.14	0.15	1.45	1.54	1.53	1.39	0.11	0.79	1.55	1.58
d, Delay for Lane Group [s/veh]	272.70	37.56	37.68	302.20	300.86	307.07	206.86	15.53	61.32	286.87	300.76
Lane Group LOS	F	D	D	F	F	F	F	B	E	F	F
Critical Lane Group	yes	no	no	no	yes	yes	no	no	no	no	yes
50th-Percentile Queue Length [veh]	8.61	1.29	1.21	10.86	37.32	25.93	68.15	1.24	2.29	75.06	76.53
50th-Percentile Queue Length [ft]	215.35	32.32	30.36	271.46	933.07	648.15	1703.80	30.95	57.35	1876.54	1913.17
95th-Percentile Queue Length [veh]	14.57	2.33	2.19	18.01	57.57	40.32	101.53	2.23	4.13	114.52	117.40
95th-Percentile Queue Length [ft]	364.33	58.18	54.64	450.22	1439.15	1008.02	2538.37	55.71	103.23	2862.91	2934.90

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	272.70	37.57	37.68	302.20	300.86	300.86	307.07	206.86	15.53	61.32	293.40	300.76
Movement LOS	F	D	D	F	F	F	F	F	B	E	F	F
d_A, Approach Delay [s/veh]	166.47			301.15			214.54			286.79		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	250.47											
Intersection LOS	F											
Intersection V/C	1.308											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX 8.2:

HORIZON YEAR (2035) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Intersection Level Of Service Report
#86: Hamner Avenue / 68th Street

Control Type:	Signalized	Delay (sec / veh):	52.0
Analysis Method:	HCM2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.648

Intersection Setup

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	280.00	100.00	100.00	250.00	100.00	100.00	200.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Base Volume Input [veh/h]	55	847	194	82	708	54	153	204	92	309	199	154
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	4	4	0	0	0	2	0	16	8	16
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	62	0	0	18	0	0	18	0	0	32
Total Hourly Volume [veh/h]	55	847	136	86	708	36	153	206	74	325	207	138
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	230	37	23	192	10	42	56	20	88	56	38
Total Analysis Volume [veh/h]	60	921	148	93	770	39	166	224	80	353	225	150
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0
All red [s]	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Split [s]	12	34	0	12	34	0	23	34	0	25	36	0
Vehicle Extension [s]	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	L	C	R
L, Total Lost Time per Cycle [s]	5.00	7.00	7.00	5.00	7.00	7.00	5.00	7.00	5.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	5.00	5.00	3.00	5.00	5.00	3.00	5.00	3.00	5.00	5.00
g_i, Effective Green Time [s]	6	31	31	8	33	33	13	22	20	30	30
g / C, Green / Cycle	0.06	0.30	0.30	0.07	0.31	0.31	0.12	0.21	0.19	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.04	0.18	0.18	0.06	0.14	0.14	0.10	0.19	0.22	0.13	0.11
s, saturation flow rate [veh/h]	1597	3192	1531	1597	3192	1628	1597	1602	1597	1676	1425
c, Capacity [veh/h]	88	952	457	114	1005	512	192	340	303	471	401
d1, Uniform Delay [s]	48.70	31.45	31.48	48.06	28.66	28.68	45.33	40.23	42.55	31.33	30.32
k, delay calibration	0.04	0.50	0.50	0.04	0.50	0.50	0.06	0.29	0.50	0.23	0.23
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.44	2.77	5.74	5.23	1.43	2.81	6.26	18.99	104.79	1.60	1.24
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

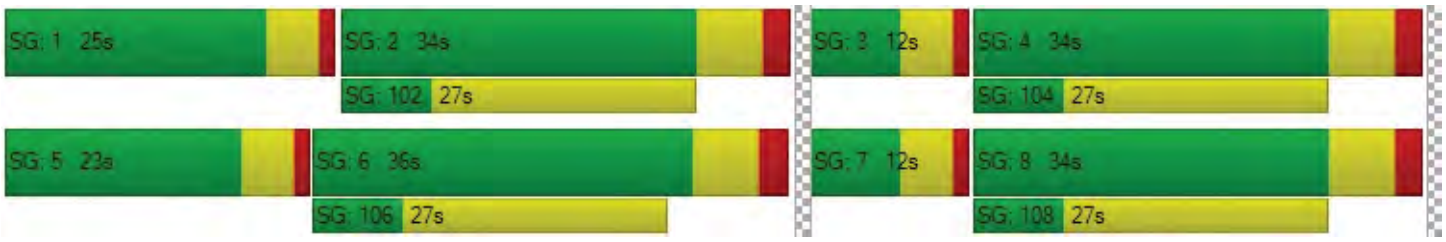
X, volume / capacity	0.68	0.60	0.60	0.82	0.45	0.45	0.86	0.89	1.17	0.48	0.37
d, Delay for Lane Group [s/veh]	52.14	34.22	37.22	53.29	30.09	31.49	51.59	59.22	147.34	32.93	31.56
Lane Group LOS	D	C	D	D	C	C	D	E	F	C	C
Critical Lane Group	no	no	yes	yes	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	1.58	6.22	6.38	2.49	4.47	4.78	4.43	9.08	16.30	4.73	3.05
50th-Percentile Queue Length [ft]	39.50	155.59	159.41	62.20	111.87	119.53	110.66	226.96	407.41	118.24	76.34
95th-Percentile Queue Length [veh]	2.84	10.31	10.52	4.48	7.94	8.37	7.88	14.02	24.72	8.30	5.50
95th-Percentile Queue Length [ft]	71.09	257.87	262.95	111.96	198.60	209.19	196.92	350.49	618.02	207.40	137.40

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	52.14	34.76	37.22	53.29	30.51	31.49	51.59	59.22	59.22	147.34	32.93	31.56
Movement LOS	D	C	D	D	C	C	D	E	E	F	C	C
d_A, Approach Delay [s/veh]	36.32			33.31			56.52			88.12		
Approach LOS	D			C			E			F		
d_I, Intersection Delay [s/veh]	51.96											
Intersection LOS	D											
Intersection V/C	0.648											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	2269	719	942	1264	0	0	0	0	285	2	494
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0.0	182.7	182.7	184.5	175.9	0.0				179.2	182.4	182.7
Adj Flow Rate, veh/h	0	2339	741	971	1303	0				197	0	615
Adj No. of Lanes	0	2	1	2	2	0				1	0	2
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	4	4	3	8	0				6	0	4
Cap, veh/h	0	1166	522	1042	2282	0				369	0	668
Arrive On Green	0.00	0.34	0.34	0.20	0.46	0.00				0.22	0.00	0.22
Sat Flow, veh/h	0	3563	1553	3408	3431	0				1707	0	3084
Grp Volume(v), veh/h	0	2339	741	971	1303	0				197	0	615
Grp Sat Flow(s),veh/h/ln	0	1736	1553	1704	1671	0				1707	0	1542
Q Serve(g_s), s	0.0	36.6	36.6	30.6	31.2	0.0				11.2	0.0	21.3
Cycle Q Clear(g_c), s	0.0	36.6	36.6	30.6	31.2	0.0				11.2	0.0	21.3
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1166	522	1042	2282	0				369	0	668
V/C Ratio(X)	0.00	2.01	1.42	0.93	0.57	0.00				0.53	0.00	0.92
Avail Cap(c_a), veh/h	0	1166	522	1109	2282	0				383	0	693
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	36.2	36.2	42.3	17.9	0.0				37.9	0.0	41.8
Incr Delay (d2), s/veh	0.0	455.9	200.3	1.6	0.1	0.0				0.6	0.0	17.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	91.3	44.7	14.7	14.4	0.0				5.3	0.0	10.6
LnGrp Delay(d),s/veh	0.0	492.1	236.6	43.8	18.0	0.0				38.5	0.0	58.8
LnGrp LOS		F	F	D	B					D		E
Approach Vol, veh/h		3080			2274						812	
Approach Delay, s/veh		430.6			29.0						53.9	
Approach LOS		F			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	37.9	42.1		29.1		80.0		
Change Period (Y+Rc), s	4.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	35.5	34.5		24.5		74.5		
Max Q Clear Time (g_c+I1), s	32.6	38.6		23.3		33.2		
Green Ext Time (p_c), s	0.8	0.0		0.3		33.7		

Intersection Summary	
HCM 2010 Ctrl Delay	232.9
HCM 2010 LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	363	2191	0	0	1800	755	433	5	423	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	182.7	179.2	0.0	0.0	181.0	182.7	174.3	177.9	181.0			
Adj Flow Rate, veh/h	390	2356	0	0	1935	812	610	0	305			
Adj No. of Lanes	2	2	0	0	2	1	2	0	1			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	4	6	0	0	5	4	9	0	5			
Cap, veh/h	479	2307	0	0	1700	766	740	0	343			
Arrive On Green	0.14	0.68	0.00	0.00	0.49	0.49	0.22	0.00	0.22			
Sat Flow, veh/h	3375	3495	0	0	3529	1548	3320	0	1538			
Grp Volume(v), veh/h	390	2356	0	0	1935	812	610	0	305			
Grp Sat Flow(s),veh/h/ln	1688	1703	0	0	1719	1548	1660	0	1538			
Q Serve(g_s), s	12.3	74.5	0.0	0.0	54.4	54.4	19.2	0.0	21.1			
Cycle Q Clear(g_c), s	12.3	74.5	0.0	0.0	54.4	54.4	19.2	0.0	21.1			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	479	2307	0	0	1700	766	740	0	343			
V/C Ratio(X)	0.82	1.02	0.00	0.00	1.14	1.06	0.82	0.00	0.89			
Avail Cap(c_a), veh/h	1089	2307	0	0	1700	766	740	0	343			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.09	0.09	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	45.8	17.7	0.0	0.0	27.8	27.8	40.7	0.0	41.4			
Incr Delay (d2), s/veh	0.3	12.3	0.0	0.0	69.8	49.7	10.2	0.0	27.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.8	38.2	0.0	0.0	42.2	33.8	9.9	0.0	11.6			
LnGrp Delay(d),s/veh	46.1	30.0	0.0	0.0	97.6	77.5	50.9	0.0	68.9			
LnGrp LOS	D	F			F	F	D		E			
Approach Vol, veh/h		2746			2747			915				
Approach Delay, s/veh		32.3			91.7			56.9				
Approach LOS		C			F			E				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		80.0			20.1	59.9		30.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.5
Max Green Setting (Gmax), s		74.5			35.5	34.5		24.5
Max Q Clear Time (g_c+I1), s		76.5			14.3	56.4		23.1
Green Ext Time (p_c), s		0.0			1.3	0.0		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	61.3
HCM 2010 LOS	E

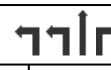
Notes

User approved volume balancing among the lanes for turning movement.

Intersection Level Of Service Report
#89: Pats Ranch Road / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	129.6
Analysis Method:	HCM2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.028

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	170.00	100.00	100.00
Speed [mph]	35.00			50.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			no			no			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Limonite Avenue			Limonite Avenue		
Base Volume Input [veh/h]	671	50	283	17	50	104	70	1189	197	359	1698	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	83	0	24	0	0	0	0	0	20	6	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	35	0	0	0	0	0	42	0	0	0
Total Hourly Volume [veh/h]	754	50	272	17	50	104	70	1189	175	365	1698	20
Peak Hour Factor	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210	0.9210
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	205	14	74	5	14	28	19	323	48	99	461	5
Total Analysis Volume [veh/h]	819	54	295	18	54	113	76	1291	190	396	1844	22
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	6	0	5	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	4.7	0.0	3.2	4.7	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	30	37	0	9	16	0	10	45	0	29	64	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	1.5	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	11	0	0	0	0
Pedestrian Clearance [s]	0	20	0	0	0	0	0	13	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	3.7	0.0	2.2	3.7	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	no		no	no		no	yes		no	yes	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	5.70	5.70	4.20	5.70	5.70
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	3.70	3.70	2.20	3.70	3.70
g_i, Effective Green Time [s]	26	36	36	2	12	6	39	39	25	58	58
g / C, Green / Cycle	0.22	0.30	0.30	0.02	0.10	0.05	0.33	0.33	0.21	0.49	0.49
(v / s)_i Volume / Saturation Flow Rate	0.26	0.03	0.21	0.01	0.11	0.05	0.40	0.13	0.25	0.58	0.02
s, saturation flow rate [veh/h]	3101	1676	1425	1597	1498	1597	3192	1425	1597	3192	1425
c, Capacity [veh/h]	672	497	422	32	149	81	1047	467	330	1550	692
d1, Uniform Delay [s]	47.03	30.71	37.48	58.35	54.06	56.80	40.34	31.28	47.62	30.88	16.13
k, delay calibration	0.16	0.11	0.24	0.11	0.47	0.28	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	103.14	0.10	4.50	15.21	107.42	59.33	113.23	2.61	115.43	92.01	0.09
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

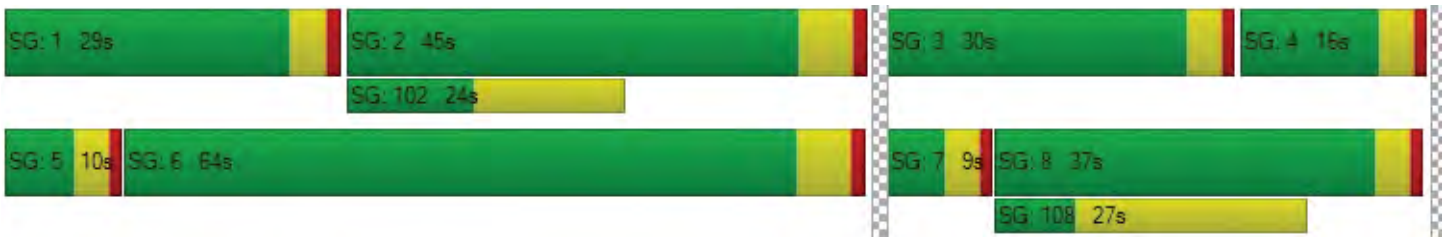
X, volume / capacity	1.22	0.11	0.70	0.57	1.12	0.94	1.23	0.41	1.20	1.19	0.03
d, Delay for Lane Group [s/veh]	150.17	30.80	41.98	73.56	161.48	116.13	153.57	33.89	163.05	122.89	16.22
Lane Group LOS	F	C	D	E	F	F	F	C	F	F	B
Critical Lane Group	yes	no	no	no	yes	no	yes	no	yes	no	no
50th-Percentile Queue Length [veh]	19.49	1.15	8.09	0.66	8.78	3.58	31.15	4.47	20.10	40.28	0.32
50th-Percentile Queue Length [ft]	487.26	28.68	202.24	16.49	219.62	89.44	778.80	111.77	502.61	1006.93	8.00
95th-Percentile Queue Length [veh]	29.55	2.07	12.75	1.19	14.24	6.44	45.73	7.94	30.12	57.45	0.58
95th-Percentile Queue Length [ft]	738.77	51.63	318.86	29.68	356.03	160.99	1143.23	198.46	752.94	1436.22	14.39

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	150.17	30.80	41.98	73.56	161.48	161.48	116.13	153.57	33.89	163.05	122.89	16.22
Movement LOS	F	C	D	E	F	F	F	F	C	F	F	B
d_A, Approach Delay [s/veh]	117.32			152.92			137.13			128.88		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	129.62											
Intersection LOS	F											
Intersection V/C	1.028											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
#90: Pats Ranch Road / 65th Street

Control Type:	Signalized	Delay (sec / veh):	49.2
Analysis Method:	HCM2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.331

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	90.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Base Volume Input [veh/h]	85	582	58	14	230	17	89	10	50	63	12	64
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	114	0	0	28	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	3	0	0	0	0	0	16	0	0	24
Total Hourly Volume [veh/h]	85	696	55	14	258	17	89	10	34	63	12	40
Peak Hour Factor	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240	0.8240
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	211	17	4	78	5	27	3	10	19	4	12
Total Analysis Volume [veh/h]	103	845	67	17	313	21	108	12	41	76	15	49
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	0	1	6	0	0	4	0	0	8	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.6	3.6	0.0	3.6	3.6	0.0	0.0	3.6	0.0	0.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	22	39	0	12	29	0	0	69	0	0	69	0
Vehicle Extension [s]	2.5	2.5	0.0	2.5	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	15	0	0	15	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.6	2.6	0.0	2.6	2.6	0.0	0.0	2.6	0.0	0.0	2.6	0.0
Minimum Recall	no	no		no	no			no			no	
Maximum Recall	no	yes		no	yes			no			no	
Pedestrian Recall	no	no		no	no			no			no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	9	86	86	3	80	80	17	17	17	17
g / C, Green / Cycle	0.08	0.72	0.72	0.03	0.67	0.67	0.14	0.14	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.06	0.21	0.21	0.01	0.10	0.01	0.09	0.04	0.11	0.03
s, saturation flow rate [veh/h]	1597	1676	1619	1597	3192	1425	1253	1475	806	1425
c, Capacity [veh/h]	124	1205	1164	40	2125	949	60	208	169	201
d1, Uniform Delay [s]	54.51	5.99	5.99	57.61	7.43	6.80	59.97	45.88	53.16	45.81
k, delay calibration	0.08	0.50	0.50	0.08	0.50	0.50	0.08	0.08	0.08	0.08
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.88	0.61	0.63	5.17	0.15	0.04	369.41	0.47	1.98	0.46
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

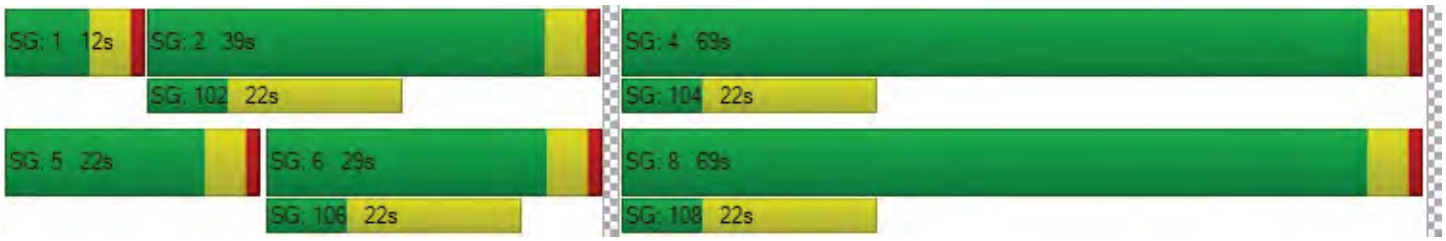
X, volume / capacity	0.83	0.29	0.29	0.42	0.15	0.02	1.80	0.25	0.54	0.24
d, Delay for Lane Group [s/veh]	64.39	6.60	6.62	62.78	7.57	6.84	429.38	46.35	55.13	46.27
Lane Group LOS	E	A	A	E	A	A	F	D	E	D
Critical Lane Group	no	no	yes	yes	no	no	no	no	yes	no
50th-Percentile Queue Length [veh]	3.38	2.95	2.86	0.56	1.44	0.18	8.01	1.45	2.81	1.34
50th-Percentile Queue Length [ft]	84.55	73.77	71.44	14.06	35.89	4.56	200.20	36.37	70.16	33.59
95th-Percentile Queue Length [veh]	6.09	5.31	5.14	1.01	2.58	0.33	14.41	2.62	5.05	2.42
95th-Percentile Queue Length [ft]	152.19	132.79	128.60	25.31	64.61	8.21	360.35	65.47	126.29	60.45

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	64.39	6.61	6.62	62.78	7.57	6.84	429.38	46.35	46.35	55.13	55.13	46.27
Movement LOS	E	A	A	E	A	A	F	D	D	E	E	D
d_A, Approach Delay [s/veh]	14.17			10.20			303.29			52.03		
Approach LOS	B			B			F			D		
d_I, Intersection Delay [s/veh]	49.24											
Intersection LOS	D											
Intersection V/C	0.331											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
#91: Pats Ranch Road / Driveway 1

Control Type:	Two-way stop	Delay (sec / veh):	9.6
Analysis Method:	HCM2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.025

Intersection Setup

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	150.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		yes	

Volumes

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Base Volume Input [veh/h]	0	725	343	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	114	14	14	0	18
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	839	357	14	0	18
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	228	97	4	0	5
Total Analysis Volume [veh/h]	0	912	388	15	0	20
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.00	0.00	0.00	0.02
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	9.58
Movement LOS		A	A	A		A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.08
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	1.91
d_A, Approach Delay [s/veh]	0.00		0.00		9.58	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.14					
Intersection LOS	A					

Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	114	0	30	139	0	164	12	561	93	64	297	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	68	68	68	68	68	68	68	68	68	68	68	68
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	168	0	44	204	0	241	18	825	137	94	437	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1083	1632	229	1336	1575	481	457	0	0	962	0	0
Stage 1	635	635	-	929	929	-	-	-	-	-	-	-
Stage 2	448	997	-	407	646	-	-	-	-	-	-	-
Critical Hdwy	7.5	6.5	6.9	7.5	6.5	6.9	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.5	5.5	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	*302	131	780	~ 180	144	*878	1114	-	-	887	-	-
Stage 1	*438	476	-	465	473	-	-	-	-	-	-	-
Stage 2	*828	433	-	597	470	-	-	-	-	-	-	-
Platoon blocked, %	1	1		1	1	1		-	-	1	-	-
Mov Cap-1 Maneuver	*199	115	780	~ 154	126	*878	1114	-	-	887	-	-
Mov Cap-2 Maneuver	*301	222	-	347	311	-	-	-	-	-	-	-
Stage 1	*431	426	-	458	465	-	-	-	-	-	-	-
Stage 2	*591	426	-	504	420	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30.7	19.1	0.1	1.6
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1114	-	-	345	347	878	887	-	-
HCM Lane V/C Ratio	0.016	-	-	0.614	0.589	0.275	0.106	-	-
HCM Control Delay (s)	8.3	-	-	30.7	29.2	10.6	9.5	-	-
HCM Lane LOS	A	-	-	D	D	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	3.9	3.6	1.1	0.4	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection Level Of Service Report
#93: Pats Ranch Road / 68th Street

Control Type:	All-way stop	Delay (sec / veh):	451.6
Analysis Method:	HCM2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name				Pats Ranch Road			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	220.00
Speed [mph]	25.00			35.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			yes			no			no		

Volumes

Name				Pats Ranch Road			68th Street			68th Street		
Base Volume Input [veh/h]	50	82	13	58	28	333	484	786	17	5	732	88
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	8	0	40	10	0	0	0	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	82	13	66	28	373	494	786	17	5	732	90
Peak Hour Factor	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390	0.7390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	28	4	22	9	126	167	266	6	2	248	30
Total Analysis Volume [veh/h]	68	111	18	89	38	505	668	1064	23	7	991	122
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.89	2.03	1.17	0.40	27.29	45.88	95.02	0.06	24.90	24.90	1.35
95th-Percentile Queue Length [ft]	22.29	50.69	29.24	9.95	682.22	1147.03	2375.38	1.58	622.4	622.4	33.82
Approach Delay [s/veh]	21.61		208.22			750.56		196.27			
Approach LOS	C		F			F		F			
Intersection Delay [s/veh]	451.65										
Intersection LOS	F										

Intersection Level Of Service Report
#94: Wineville Avenue / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	77.7
Analysis Method:	HCM2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.921

Intersection Setup

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Pocket Length [ft]	185.00	100.00	100.00	100.00	100.00	100.00	250.00	100.00	360.00	245.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Base Volume Input [veh/h]	88	126	60	86	91	300	177	1244	68	33	1689	59
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	24	0	0	6	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	24	0	0	0
Total Hourly Volume [veh/h]	88	126	60	86	91	300	177	1268	44	33	1695	59
Peak Hour Factor	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380	0.9380
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	34	16	23	24	80	47	338	12	9	452	16
Total Analysis Volume [veh/h]	94	134	64	92	97	320	189	1352	47	35	1807	63
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	26.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	5	0	4	5	0	4	6	0	4	6	0
Maximum Green [s]	37	58	0	37	58	0	20	0	0	75	0	0
Amber [s]	3.0	4.3	0.0	3.0	4.3	0.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0
Split [s]	11	32	0	13	34	0	16	58	0	17	59	0
Vehicle Extension [s]	1.5	2.0	0.0	1.5	2.0	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Walk [s]	0	5	0	0	5	0	0	10	0	0	10	0
Pedestrian Clearance [s]	0	21	0	0	16	0	0	13	0	0	12	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	1.5	3.3	0.0	1.5	3.3	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	no		no	no		no	yes		no	yes	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	L	C	R	L	C	C
L, Total Lost Time per Cycle [s]	3.50	5.30	5.30	3.50	5.30	3.50	6.00	6.00	3.50	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.50	3.30	3.30	1.50	3.30	1.50	4.00	4.00	1.50	4.00	4.00
g_i, Effective Green Time [s]	8	28	28	8	29	13	63	63	3	53	53
g / C, Green / Cycle	0.06	0.24	0.24	0.06	0.24	0.10	0.52	0.52	0.03	0.44	0.44
(v / s)_i Volume / Saturation Flow Rate	0.05	0.05	0.06	0.05	0.25	0.11	0.38	0.03	0.02	0.50	0.51
s, saturation flow rate [veh/h]	1774	1863	1667	1774	1641	1774	3547	1583	1774	1863	1841
c, Capacity [veh/h]	111	439	393	115	390	185	1851	826	45	825	815
d1, Uniform Delay [s]	55.69	37.09	37.21	55.35	45.73	53.76	22.16	14.14	58.17	33.43	33.43
k, delay calibration	0.23	0.04	0.04	0.10	0.46	0.42	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	29.07	0.10	0.12	11.22	63.04	66.71	2.58	0.13	10.54	75.04	80.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

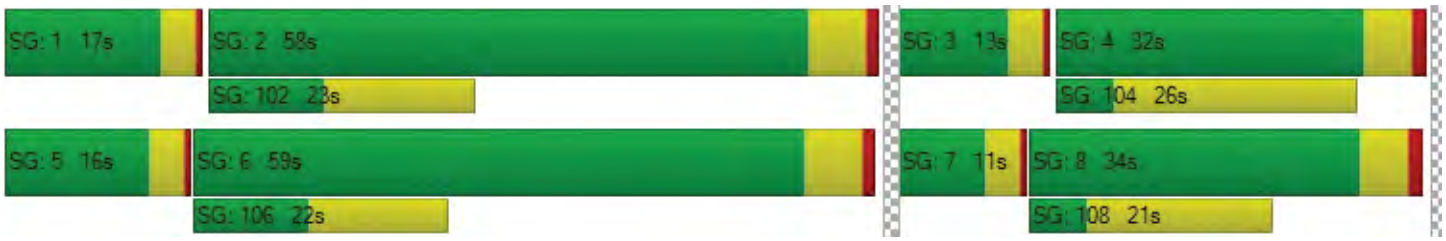
X, volume / capacity	0.85	0.23	0.24	0.80	1.07	1.02	0.73	0.06	0.78	1.13	1.15
d, Delay for Lane Group [s/veh]	84.75	37.19	37.33	66.57	108.77	120.47	24.74	14.27	68.71	108.47	113.43
Lane Group LOS	F	D	D	E	F	F	C	B	E	F	F
Critical Lane Group	yes	no	no	no	yes	yes	no	no	no	no	yes
50th-Percentile Queue Length [veh]	3.64	2.37	2.25	3.04	18.01	8.85	14.20	0.63	1.15	38.78	39.45
50th-Percentile Queue Length [ft]	91.10	59.30	56.16	75.94	450.17	221.23	354.95	15.76	28.69	969.43	986.13
95th-Percentile Queue Length [veh]	6.56	4.27	4.04	5.47	25.94	13.85	20.38	1.13	2.07	53.69	54.91
95th-Percentile Queue Length [ft]	163.98	106.73	101.08	136.69	648.43	346.35	509.43	28.36	51.64	1342.23	1372.66

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	84.75	37.22	37.33	66.57	108.77	108.77	120.47	24.74	14.27	68.71	110.86	113.43
Movement LOS	F	D	D	E	F	F	F	C	B	E	F	F
d_A, Approach Delay [s/veh]	52.55			101.15			35.83			110.17		
Approach LOS	D			F			D			F		
d_I, Intersection Delay [s/veh]	77.69											
Intersection LOS	E											
Intersection V/C	0.921											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
#86: Hamner Avenue / 68th Street

Control Type:	Signalized	Delay (sec / veh):	50.8
Analysis Method:	HCM2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.657

Intersection Setup

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	280.00	100.00	100.00	250.00	100.00	100.00	200.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Base Volume Input [veh/h]	60	1325	267	87	867	122	84	107	58	285	168	175
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	16	16	0	0	0	8	0	9	4	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	72	0	0	16	0	0	10	0	0	38
Total Hourly Volume [veh/h]	60	1325	211	103	867	106	84	115	48	294	172	146
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	360	57	28	236	29	23	31	13	80	47	40
Total Analysis Volume [veh/h]	65	1440	229	112	942	115	91	125	52	320	187	159
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0
All red [s]	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Split [s]	12	34	0	12	34	0	17	34	0	20	37	0
Vehicle Extension [s]	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	L	C	R
L, Total Lost Time per Cycle [s]	5.00	7.00	7.00	5.00	7.00	7.00	5.00	7.00	5.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	5.00	5.00	3.00	5.00	5.00	3.00	5.00	3.00	5.00	5.00
g_i, Effective Green Time [s]	6	39	39	9	42	42	7	13	15	21	21
g / C, Green / Cycle	0.06	0.39	0.39	0.09	0.42	0.42	0.07	0.13	0.15	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.04	0.27	0.27	0.07	0.18	0.18	0.06	0.11	0.20	0.11	0.11
s, saturation flow rate [veh/h]	1597	3192	1530	1597	3192	1566	1597	1594	1597	1676	1425
c, Capacity [veh/h]	93	1251	599	136	1336	656	112	214	237	357	304
d1, Uniform Delay [s]	46.18	25.45	25.48	44.99	20.69	20.71	45.84	42.10	42.55	34.83	34.83
k, delay calibration	0.04	0.50	0.50	0.04	0.50	0.50	0.04	0.23	0.50	0.23	0.23
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.48	3.27	6.72	4.75	1.05	2.14	5.36	15.37	182.88	2.53	2.97
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

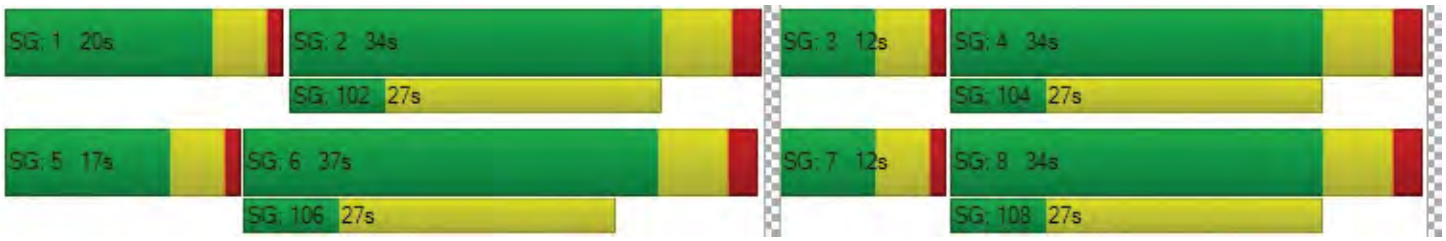
X, volume / capacity	0.70	0.70	0.70	0.83	0.44	0.44	0.82	0.83	1.35	0.52	0.52
d, Delay for Lane Group [s/veh]	49.67	28.72	32.20	49.74	21.74	22.85	51.20	57.47	225.42	37.36	37.80
Lane Group LOS	D	C	C	D	C	C	D	E	F	D	D
Critical Lane Group	no	no	yes	yes	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	1.62	8.61	8.86	2.81	4.72	4.85	2.31	4.99	17.62	4.10	3.52
50th-Percentile Queue Length [ft]	40.50	215.36	221.59	70.23	118.11	121.23	57.85	124.74	440.52	102.38	87.98
95th-Percentile Queue Length [veh]	2.92	13.43	13.75	5.06	8.29	8.46	4.17	8.65	27.71	7.37	6.33
95th-Percentile Queue Length [ft]	72.91	335.70	343.66	126.41	207.22	211.52	104.13	216.32	692.65	184.28	158.37

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	49.67	29.34	32.20	49.74	22.00	22.85	51.20	57.47	57.47	225.42	37.36	37.80
Movement LOS	D	C	C	D	C	C	D	E	E	F	D	D
d_A, Approach Delay [s/veh]	30.80			25.24			55.34			127.82		
Approach LOS	C			C			E			F		
d_I, Intersection Delay [s/veh]	50.82											
Intersection LOS	D											
Intersection V/C	0.657											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
#90: Pats Ranch Road / 65th Street

Control Type:	Signalized	Delay (sec / veh):	14.4
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.405

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	90.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Base Volume Input [veh/h]	98	461	45	66	454	47	50	4	47	35	14	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	59	0	0	112	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	18	0	0	18
Total Hourly Volume [veh/h]	98	520	45	66	566	47	50	4	29	35	14	23
Peak Hour Factor	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530	0.7530
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	173	15	22	188	16	17	1	10	12	5	8
Total Analysis Volume [veh/h]	130	691	60	88	752	62	66	5	39	46	19	31
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	70
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	0	1	6	0	0	4	0	0	8	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.6	3.6	0.0	3.6	3.6	0.0	0.0	3.6	0.0	0.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	12	27	0	12	27	0	0	31	0	0	31	0
Vehicle Extension [s]	2.5	2.5	0.0	2.5	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	15	0	0	15	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.6	2.6	0.0	2.6	2.6	0.0	0.0	2.6	0.0	0.0	2.6	0.0
Minimum Recall	no	no		no	no			no			no	
Maximum Recall	no	yes		no	yes			no			no	
Pedestrian Recall	no	no		no	no			no			no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	7	43	43	6	42	42	7	7	7	7
g / C, Green / Cycle	0.10	0.61	0.61	0.08	0.60	0.60	0.11	0.11	0.11	0.11
(v / s)_i Volume / Saturation Flow Rate	0.08	0.18	0.18	0.06	0.24	0.04	0.05	0.03	0.09	0.02
s, saturation flow rate [veh/h]	1597	1676	1618	1597	3192	1425	1249	1450	742	1425
c, Capacity [veh/h]	158	1032	996	130	1910	853	103	153	166	150
d1, Uniform Delay [s]	30.89	6.30	6.30	31.20	7.38	5.90	34.95	28.84	31.53	28.59
k, delay calibration	0.14	0.50	0.50	0.08	0.50	0.50	0.08	0.08	0.08	0.08
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	12.69	0.72	0.75	4.50	0.61	0.17	4.81	0.76	1.11	0.50
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

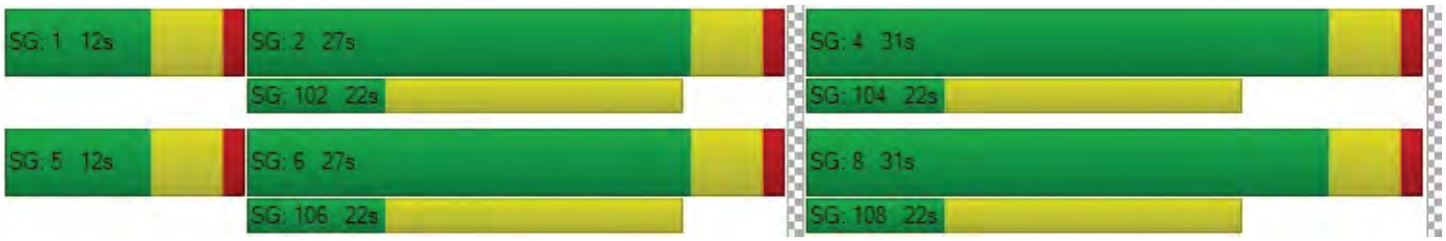
X, volume / capacity	0.82	0.29	0.29	0.68	0.39	0.07	0.64	0.29	0.39	0.21
d, Delay for Lane Group [s/veh]	43.59	7.02	7.04	35.70	7.99	6.06	39.76	29.60	32.64	29.09
Lane Group LOS	D	A	A	D	A	A	D	C	C	C
Critical Lane Group	yes	no	no	no	yes	no	no	no	yes	no
50th-Percentile Queue Length [veh]	2.59	1.82	1.76	1.53	2.48	0.34	1.28	0.70	1.12	0.49
50th-Percentile Queue Length [ft]	64.82	45.41	44.02	38.36	62.02	8.62	32.10	17.49	27.96	12.17
95th-Percentile Queue Length [veh]	4.67	3.27	3.17	2.76	4.47	0.62	2.31	1.26	2.01	0.88
95th-Percentile Queue Length [ft]	116.68	81.74	79.23	69.06	111.64	15.51	57.79	31.49	50.32	21.91

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	43.59	7.03	7.04	35.70	7.99	6.06	39.76	29.60	29.60	32.64	32.64	29.09
Movement LOS	D	A	A	D	A	A	D	C	C	C	C	C
d_A, Approach Delay [s/veh]	13.60			10.56			35.70			31.49		
Approach LOS	B			B			D			C		
d_I, Intersection Delay [s/veh]	14.37											
Intersection LOS	B											
Intersection V/C	0.405											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
#91: Pats Ranch Road / Driveway 1

Control Type:	Two-way stop	Delay (sec / veh):	10.7
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.017

Intersection Setup

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	150.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		yes	

Volumes

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Base Volume Input [veh/h]	0	604	536	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	59	56	56	0	10
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	663	592	56	0	10
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	180	161	15	0	3
Total Analysis Volume [veh/h]	0	721	643	61	0	11
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.00	0.02
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	10.69
Movement LOS		A	A	A		B
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.05
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	1.30
d_A, Approach Delay [s/veh]	0.00		0.00		10.69	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.08					
Intersection LOS	B					

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	59	0	16	125	0	203	48	401	123
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	100	-	-
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	66	66	66	66	66	66	66	66	66
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0
Mvmt Flow	89	0	24	189	0	308	73	608	186

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	1469	1959	381	1485	1908	397	762	0	0
Stage 1	1020	1020	-	846	846	-	-	-	-
Stage 2	449	939	-	639	1062	-	-	-	-
Critical Hdwy	4	4	4	4	4	4	4.1	-	-
Critical Hdwy Stg 1	4	4	-	4	4	-	-	-	-
Critical Hdwy Stg 2	6	5	-	6	5	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-
Pot Cap-1 Maneuver	390	244	846	385	254	*930	859	-	-
Stage 1	522	484	-	646	583	-	-	-	-
Stage 2	866	463	-	476	351	-	-	-	-
Platoon blocked, %	1	1		1	1	1		-	-
Mov Cap-1 Maneuver	216	189	846	309	197	*930	859	-	-
Mov Cap-2 Maneuver	331	252	-	303	213	-	-	-	-
Stage 1	478	410	-	591	533	-	-	-	-
Stage 2	531	424	-	392	298	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	18.5	19.9	0.8
HCM LOS	C	C	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	859	-	-	380	303	930	985	-	-
HCM Lane V/C Ratio	0.085	-	-	0.299	0.625	0.331	0.152	-	-
HCM Control Delay (s)	9.6	-	-	18.5	34.8	10.8	9.3	-	-
HCM Lane LOS	A	-	-	C	D	B	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	1.2	3.9	1.5	0.5	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	

Movement	SBL	SBT	SBR
Vol, veh/h	99	447	56
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	100	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	66	66	66
Heavy Vehicles, %	0	0	0
Mvmt Flow	150	677	85

Major/Minor	Major2		
Conflicting Flow All	794	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	-
Pot Cap-1 Maneuver	985	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	1	-	-
Mov Cap-1 Maneuver	985	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	1.5
HCM LOS	

Minor Lane/Major Mvmt

Intersection Level Of Service Report
#93: Pats Ranch Road / 68th Street

Control Type:	All-way stop	Delay (sec / veh):	352.1
Analysis Method:	HCM2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name				Pats Ranch Road			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	220.00
Speed [mph]	25.00			35.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			yes			no			no		

Volumes

Name				Pats Ranch Road			68th Street			68th Street		
Base Volume Input [veh/h]	33	54	9	163	93	399	341	493	57	15	599	183
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	4	0	22	40	0	0	0	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	54	9	167	93	421	381	493	57	15	599	191
Peak Hour Factor	0.6780	0.6780	0.6780	0.6780	1.0000	0.6780	0.6780	0.6780	1.0000	1.0000	0.6780	0.6780
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	20	3	62	23	155	140	182	14	4	221	70
Total Analysis Volume [veh/h]	49	80	13	246	93	621	562	727	57	15	883	282
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.64	1.36	7.37	1.29	43.38	37.94	63.08	0.15	21.24	21.24	6.63
95th-Percentile Queue Length [ft]	15.93	34.03	184.13	32.25	1084.40	948.38	1577.00	3.68	530.8	530.8	165.7
Approach Delay [s/veh]	20.27		319.83			582.73		155.29			
Approach LOS	C		F			F		F			
Intersection Delay [s/veh]	352.12										
Intersection LOS	F										

Intersection Level Of Service Report
#86: Hamner Avenue / 68th Street

Control Type:	Signalized	Delay (sec / veh):	53.2
Analysis Method:	HCM2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.709

Intersection Setup

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	280.00	100.00	100.00	250.00	100.00	100.00	200.00	100.00	100.00	205.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Hamner Avenue			Hamner Avenue			68th Street			68th Street		
Base Volume Input [veh/h]	85	1335	276	186	906	103	84	125	52	292	151	185
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	16	16	0	0	0	8	0	9	4	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	77	0	0	34	0	0	11	0	0	38
Total Hourly Volume [veh/h]	85	1335	215	202	906	69	84	133	41	301	155	156
Peak Hour Factor	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	347	56	52	235	18	22	35	11	78	40	40
Total Analysis Volume [veh/h]	88	1386	223	210	941	72	87	138	43	313	161	162
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	7	7	0	7	7	0	7	7	0	7	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0	4.0	5.0	0.0
All red [s]	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Split [s]	12	34	0	12	34	0	18	34	0	20	36	0
Vehicle Extension [s]	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0	1.5	5.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0	3.0	5.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	yes		no	yes		no	no		no	no	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	L	C	R
L, Total Lost Time per Cycle [s]	5.00	7.00	7.00	5.00	7.00	7.00	5.00	7.00	5.00	7.00	7.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	3.00	5.00	5.00	3.00	5.00	5.00	3.00	5.00	3.00	5.00	5.00
g_i, Effective Green Time [s]	7	32	32	15	41	41	7	14	15	22	22
g / C, Green / Cycle	0.07	0.32	0.32	0.15	0.41	0.41	0.07	0.14	0.15	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.06	0.27	0.27	0.13	0.19	0.19	0.05	0.11	0.20	0.10	0.11
s, saturation flow rate [veh/h]	1597	3192	1530	1597	3192	1610	1597	1609	1597	1676	1425
c, Capacity [veh/h]	109	1039	498	237	1295	653	107	220	239	367	312
d1, Uniform Delay [s]	45.95	31.08	31.11	41.77	21.83	21.84	46.00	42.01	42.51	33.73	34.40
k, delay calibration	0.04	0.50	0.50	0.10	0.50	0.50	0.04	0.23	0.50	0.23	0.23
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.30	7.43	14.49	9.79	1.23	2.43	5.38	14.95	165.64	1.76	2.84
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

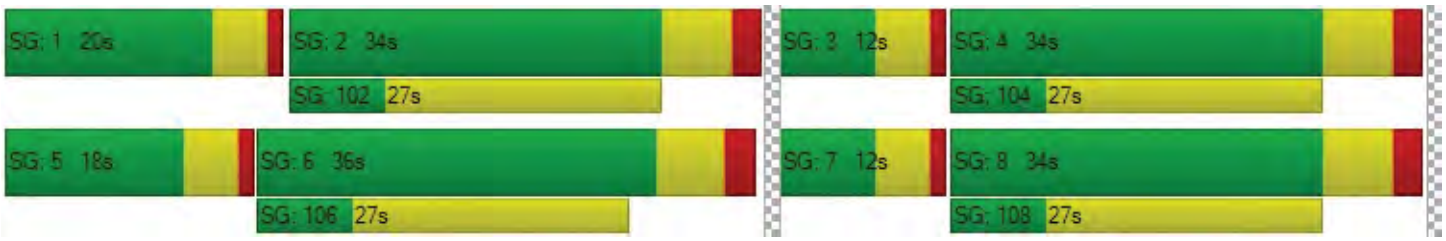
X, volume / capacity	0.81	0.82	0.83	0.89	0.47	0.47	0.81	0.82	1.31	0.44	0.52
d, Delay for Lane Group [s/veh]	51.25	38.51	45.60	51.56	23.07	24.27	51.39	56.96	208.15	35.49	37.25
Lane Group LOS	D	D	D	D	C	C	D	E	F	D	D
Critical Lane Group	no	no	yes	yes	no	no	no	yes	yes	no	no
50th-Percentile Queue Length [veh]	2.24	9.96	10.55	5.50	5.10	5.37	2.22	5.08	16.64	3.41	3.56
50th-Percentile Queue Length [ft]	55.97	248.99	263.82	137.48	127.53	134.27	55.41	126.92	416.12	85.19	88.98
95th-Percentile Queue Length [veh]	4.03	15.14	15.88	9.34	8.81	9.17	3.99	8.77	26.10	6.13	6.41
95th-Percentile Queue Length [ft]	100.74	378.38	397.01	233.62	220.14	229.28	99.74	219.29	652.62	153.34	160.16

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.25	39.79	45.60	51.56	23.40	24.27	51.39	56.96	56.96	208.15	35.49	37.25
Movement LOS	D	D	D	D	C	C	D	E	E	F	D	D
d_A, Approach Delay [s/veh]	41.49			28.70			55.15			120.91		
Approach LOS	D			C			E			F		
d_I, Intersection Delay [s/veh]	53.22											
Intersection LOS	D											
Intersection V/C	0.709											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1914	379	724	2284	0	0	0	0	550	0	628
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0.0	186.3	186.3	188.1	186.3	0.0				186.3	186.3	186.3
Adj Flow Rate, veh/h	0	2015	399	762	2404	0				797	0	427
Adj No. of Lanes	0	2	1	2	2	0				2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	1	2	0				2	0	2
Cap, veh/h	0	1403	628	834	2397	0				790	0	350
Arrive On Green	0.00	0.40	0.40	0.32	0.90	0.00				0.22	0.00	0.22
Sat Flow, veh/h	0	3632	1583	3476	3632	0				3548	0	1573
Grp Volume(v), veh/h	0	2015	399	762	2404	0				797	0	427
Grp Sat Flow(s),veh/h/ln	0	1770	1583	1738	1770	0				1774	0	1573
Q Serve(g_s), s	0.0	43.6	22.4	23.2	74.5	0.0				24.5	0.0	24.5
Cycle Q Clear(g_c), s	0.0	43.6	22.4	23.2	74.5	0.0				24.5	0.0	24.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1403	628	834	2397	0				790	0	350
V/C Ratio(X)	0.00	1.44	0.64	0.91	1.00	0.00				1.01	0.00	1.22
Avail Cap(c_a), veh/h	0	1403	628	1122	2397	0				790	0	350
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	33.2	26.8	36.4	5.5	0.0				42.8	0.0	42.8
Incr Delay (d2), s/veh	0.0	200.3	1.6	0.8	6.2	0.0				34.1	0.0	121.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	60.3	10.0	11.2	34.3	0.0				15.7	0.0	22.4
LnGrp Delay(d),s/veh	0.0	233.5	28.4	37.2	11.7	0.0				76.9	0.0	164.5
LnGrp LOS		F	C	D	F					F		F
Approach Vol, veh/h		2414			3166						1224	
Approach Delay, s/veh		199.6			17.8						107.4	
Approach LOS		F			B						F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	30.9	49.1		30.0		80.0		
Change Period (Y+Rc), s	4.5	5.5		5.5		5.5		
Max Green Setting (Gmax), s	35.5	34.5		24.5		74.5		
Max Q Clear Time (g_c+I1), s	25.2	45.6		26.5		76.5		
Green Ext Time (p_c), s	1.2	0.0		0.0		0.0		

Intersection Summary	
HCM 2010 Ctrl Delay	98.4
HCM 2010 LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	192	2292	0	0	2526	464	537	1	1027	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	184.5	186.3	0.0	0.0	188.1	188.1	186.3	187.9	188.1			
Adj Flow Rate, veh/h	200	2388	0	0	2631	483	373	0	1270			
Adj No. of Lanes	2	2	0	0	2	1	1	0	2			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	2	0	0	1	1	2	0	1			
Cap, veh/h	276	2397	0	0	1985	886	395	0	712			
Arrive On Green	0.08	0.68	0.00	0.00	0.56	0.56	0.22	0.00	0.22			
Sat Flow, veh/h	3408	3632	0	0	3668	1595	1774	0	3198			
Grp Volume(v), veh/h	200	2388	0	0	2631	483	373	0	1270			
Grp Sat Flow(s),veh/h/ln	1704	1770	0	0	1787	1595	1774	0	1599			
Q Serve(g_s), s	6.3	73.6	0.0	0.0	61.1	21.2	22.8	0.0	24.5			
Cycle Q Clear(g_c), s	6.3	73.6	0.0	0.0	61.1	21.2	22.8	0.0	24.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	276	2397	0	0	1985	886	395	0	712			
V/C Ratio(X)	0.72	1.00	0.00	0.00	1.33	0.55	0.94	0.00	1.78			
Avail Cap(c_a), veh/h	1100	2397	0	0	1985	886	395	0	712			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.09	0.09	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	49.4	17.6	0.0	0.0	24.5	15.6	42.1	0.0	42.8			
Incr Delay (d2), s/veh	0.3	4.7	0.0	0.0	150.0	2.4	33.2	0.0	358.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.0	37.1	0.0	0.0	71.1	9.9	14.7	0.0	46.2			
LnGrp Delay(d),s/veh	49.7	22.3	0.0	0.0	174.5	18.0	75.2	0.0	400.8			
LnGrp LOS	D	C			F	B	E		F			
Approach Vol, veh/h		2588			3114			1643				
Approach Delay, s/veh		24.4			150.2			326.9				
Approach LOS		C			F			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		80.0			13.4	66.6		30.0
Change Period (Y+Rc), s		5.5			4.5	5.5		5.5
Max Green Setting (Gmax), s		74.5			35.5	34.5		24.5
Max Q Clear Time (g_c+I1), s		75.6			8.3	63.1		26.5
Green Ext Time (p_c), s		0.0			0.6	0.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	145.4
HCM 2010 LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

Intersection Level Of Service Report
#89: Pats Ranch Road / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	282.0
Analysis Method:	HCM2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.475

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	170.00	100.00	100.00
Speed [mph]	35.00			50.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			no			no			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Limonite Avenue			Limonite Avenue		
Base Volume Input [veh/h]	589	100	427	50	100	163	110	2316	575	419	2197	21
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	44	0	13	0	0	0	0	0	80	24	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	64	0	0	0	0	0	87	0	0	0
Total Hourly Volume [veh/h]	633	100	376	50	100	163	110	2316	568	443	2197	21
Peak Hour Factor	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360	0.9360
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	169	27	100	13	27	44	29	619	152	118	587	6
Total Analysis Volume [veh/h]	676	107	402	53	107	174	118	2474	607	473	2347	22
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	6	0	5	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	4.7	0.0	3.2	4.7	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	23	31	0	9	17	0	10	56	0	24	70	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	1.5	3.0	0.0
Walk [s]	0	7	0	0	0	0	0	11	0	0	0	0
Pedestrian Clearance [s]	0	20	0	0	0	0	0	13	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	3.7	0.0	2.2	3.7	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	no		no	no		no	yes		no	yes	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	5.70	5.70	4.20	5.70	5.70
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	3.70	3.70	2.20	3.70	3.70
g_i, Effective Green Time [s]	19	27	27	5	13	6	50	50	20	64	64
g / C, Green / Cycle	0.16	0.22	0.22	0.04	0.11	0.05	0.42	0.42	0.17	0.54	0.54
(v / s)_i Volume / Saturation Flow Rate	0.22	0.06	0.28	0.03	0.19	0.07	0.78	0.43	0.30	0.74	0.02
s, saturation flow rate [veh/h]	3101	1676	1425	1597	1511	1597	3192	1425	1597	3192	1425
c, Capacity [veh/h]	491	375	319	66	162	80	1342	599	264	1713	765
d1, Uniform Delay [s]	50.51	38.61	46.58	57.03	53.60	56.99	34.79	34.79	50.11	27.80	13.08
k, delay calibration	0.20	0.11	0.50	0.16	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	174.43	0.41	139.82	27.05	356.61	265.77	382.69	40.16	372.18	170.26	0.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.38	0.29	1.26	0.80	1.74	1.47	1.84	1.01	1.79	1.37	0.03
d, Delay for Lane Group [s/veh]	224.93	39.03	186.39	84.08	410.20	322.77	417.48	74.95	422.29	198.07	13.15
Lane Group LOS	F	D	F	F	F	F	F	F	F	F	B
Critical Lane Group	yes	no	no	no	yes	no	yes	no	yes	no	no
50th-Percentile Queue Length [veh]	19.19	2.64	21.74	2.04	20.71	8.32	89.57	22.98	34.92	62.50	0.28
50th-Percentile Queue Length [ft]	479.66	66.05	543.53	51.05	517.83	207.95	2239.25	574.59	872.98	1562.57	7.01
95th-Percentile Queue Length [veh]	30.10	4.76	33.03	3.68	33.35	14.32	142.13	31.15	54.97	93.44	0.50
95th-Percentile Queue Length [ft]	752.47	118.88	825.63	91.90	833.76	357.98	3553.34	778.87	1374.27	2336.09	12.62

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	224.93	39.03	186.39	84.08	410.20	410.20	322.77	417.48	74.95	422.29	198.07	13.15
Movement LOS	F	D	F	F	F	F	F	F	F	F	F	B
d_A, Approach Delay [s/veh]	195.07			358.45			348.99			233.95		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	282.04											
Intersection LOS	F											
Intersection V/C	1.475											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
#90: Pats Ranch Road / 65th Street

Control Type:	Signalized	Delay (sec / veh):	27.6
Analysis Method:	HCM2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.435

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	90.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			Driveway 1			65th Street		
Base Volume Input [veh/h]	158	286	20	100	562	75	77	12	53	14	43	37
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	59	0	0	112	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	15	0	0	14
Total Hourly Volume [veh/h]	158	345	20	100	674	75	77	12	38	14	43	23
Peak Hour Factor	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590	0.8590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	46	100	6	29	196	22	22	3	11	4	13	7
Total Analysis Volume [veh/h]	184	402	23	116	785	87	90	14	44	16	50	27
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	yes
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	5	2	0	1	6	0	0	4	0	0	8	0
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.6	3.6	0.0	3.6	3.6	0.0	0.0	3.6	0.0	0.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	25	32	0	20	27	0	0	53	0	0	53	0
Vehicle Extension [s]	2.5	2.5	0.0	2.5	2.5	0.0	0.0	2.5	0.0	0.0	2.5	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	15	0	0	15	0	0	15	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.6	2.6	0.0	2.6	2.6	0.0	0.0	2.6	0.0	0.0	2.6	0.0
Minimum Recall	no	no		no	no			no			no	
Maximum Recall	no	yes		no	yes			no			no	
Pedestrian Recall	no	no		no	no			no			no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00
l2, Clearance Lost Time [s]	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	14	73	73	9	68	68	9	9	9	9
g / C, Green / Cycle	0.13	0.69	0.69	0.09	0.65	0.65	0.09	0.09	0.09	0.09
(v / s)_i Volume / Saturation Flow Rate	0.12	0.12	0.12	0.07	0.25	0.06	0.07	0.04	0.06	0.02
s, saturation flow rate [veh/h]	1597	1676	1644	1597	3192	1425	1214	1479	1152	1425
c, Capacity [veh/h]	212	1161	1139	140	2069	924	72	130	144	125
d1, Uniform Delay [s]	44.64	5.65	5.65	47.09	8.62	6.92	52.48	45.45	45.82	44.51
k, delay calibration	0.10	0.50	0.50	0.08	0.50	0.50	0.08	0.08	0.08	0.08
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.91	0.34	0.34	8.80	0.53	0.20	131.31	1.78	1.69	0.63
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.87	0.18	0.18	0.83	0.38	0.09	1.25	0.45	0.46	0.22
d, Delay for Lane Group [s/veh]	54.55	5.99	6.00	55.89	9.15	7.12	183.79	47.23	47.51	45.15
Lane Group LOS	D	A	A	E	A	A	F	D	D	D
Critical Lane Group	yes	no	no	no	yes	no	yes	no	no	no
50th-Percentile Queue Length [veh]	5.20	1.50	1.47	3.28	3.89	0.72	4.53	1.51	1.76	0.68
50th-Percentile Queue Length [ft]	129.90	37.38	36.82	82.03	97.19	17.92	113.19	37.71	44.03	17.01
95th-Percentile Queue Length [veh]	8.93	2.69	2.65	5.91	7.00	1.29	8.15	2.71	3.17	1.22
95th-Percentile Queue Length [ft]	223.35	67.29	66.28	147.65	174.94	32.26	203.74	67.87	79.26	30.62

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	54.55	5.99	6.00	55.89	9.15	7.12	183.79	47.23	47.23	47.51	47.51	45.15
Movement LOS	D	A	A	E	A	A	F	D	D	D	D	D
d_A, Approach Delay [s/veh]	21.02			14.46			130.28			46.82		
Approach LOS	C			B			F			D		
d_I, Intersection Delay [s/veh]	27.65											
Intersection LOS	C											
Intersection V/C	0.435											

Sequence

Ring 1	1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

The delay reported in the traffic study is higher than that calculated in this worksheet as the calculated delay is lower than the comparable previous scenario. This is due to the HCM 2010 methodology which reports delay as the average delay of all vehicles at the intersection. The lower delay in this scenario is due to the fact that the added volumes are to movements experiencing lower delays than most.

Intersection Level Of Service Report
#91: Pats Ranch Road / Driveway 1

Control Type:	Two-way stop	Delay (sec / veh):	11.1
Analysis Method:	HCM2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.018

Intersection Setup

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	0
Pocket Length [ft]	150.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00		35.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	no		no		yes	

Volumes

Name	Pats Ranch Road		Pats Ranch Road		Driveway 1	
Base Volume Input [veh/h]	0	463	628	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	59	56	56	0	10
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	522	684	56	0	10
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	142	186	15	0	3
Total Analysis Volume [veh/h]	0	567	743	61	0	11
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.00	0.02
d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	0.00	11.13
Movement LOS		A	A	A		B
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.06
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	1.40
d_A, Approach Delay [s/veh]	0.00		0.00		11.13	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.09					
Intersection LOS	B					

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	59	0	16	12	0	35	48	428	31	53	587	56
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	100	-	-	100	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	71	0	19	14	0	42	58	516	37	64	707	67

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1242	1538	387	1131	1552	277	775	0	0	553	0	0
Stage 1	869	869	-	650	650	-	-	-	-	-	-	-
Stage 2	373	669	-	481	902	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	131	115	611	158	112	720	837	-	-	1013	-	-
Stage 1	313	367	-	424	463	-	-	-	-	-	-	-
Stage 2	620	454	-	535	355	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	111	100	611	138	98	720	837	-	-	1013	-	-
Mov Cap-2 Maneuver	212	206	-	250	195	-	-	-	-	-	-	-
Stage 1	291	344	-	395	431	-	-	-	-	-	-	-
Stage 2	543	423	-	485	333	-	-	-	-	-	-	-

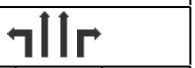
Approach	EB	WB	NB	SB
HCM Control Delay, s	27.9	12.9	0.9	0.7
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	837	-	-	246	250	720	1013	-	-
HCM Lane V/C Ratio	0.069	-	-	0.367	0.058	0.059	0.063	-	-
HCM Control Delay (s)	9.6	-	-	27.9	20.3	10.3	8.8	-	-
HCM Lane LOS	A	-	-	D	C	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1.6	0.2	0.2	0.2	-	-

Intersection Level Of Service Report
#93: Pats Ranch Road / 68th Street

Control Type:	All-way stop	Delay (sec / veh):	99.2
Analysis Method:	HCM2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Pats Ranch Road			Pats Ranch Road			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	100.00	200.00	100.00	220.00
Speed [mph]	25.00			35.00			45.00			45.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	no			yes			no			no		

Volumes

Name	Pats Ranch Road			Pats Ranch Road			68th Street			68th Street		
Base Volume Input [veh/h]	33	54	9	92	93	403	345	453	57	15	408	60
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	4	0	22	40	0	0	0	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	54	9	96	93	425	385	453	57	15	408	68
Peak Hour Factor	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480	0.8480
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	16	3	28	27	125	114	134	17	4	120	20
Total Analysis Volume [veh/h]	39	64	11	113	110	501	454	534	67	18	481	80
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.39	0.78	1.29	1.16	20.23	14.90	26.92	0.16	4.47	4.47	0.75
95th-Percentile Queue Length [ft]	9.64	19.53	32.21	29.09	505.71	372.48	673.09	4.07	111.8	111.8	18.78
Approach Delay [s/veh]	15.19		103.85			144.84		26.91			
Approach LOS	C		F			F		D			
Intersection Delay [s/veh]	99.23										
Intersection LOS	F										

Intersection Level Of Service Report
#94: Wineville Avenue / Limonite Avenue

Control Type:	Signalized	Delay (sec / veh):	248.3
Analysis Method:	HCM2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.315

Intersection Setup

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Pocket Length [ft]	185.00	100.00	100.00	100.00	100.00	100.00	250.00	100.00	360.00	245.00	100.00	100.00
Speed [mph]	45.00			45.00			45.00			55.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	yes			yes			yes			yes		

Volumes

Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Base Volume Input [veh/h]	121	56	43	149	112	421	365	2314	112	69	2094	126
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	13	0	0	24	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	32	0	0	0
Total Hourly Volume [veh/h]	121	56	43	149	112	421	365	2327	80	69	2118	126
Peak Hour Factor	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230	0.9230
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	15	12	40	30	114	99	630	22	19	574	34
Total Analysis Volume [veh/h]	131	61	47	161	121	456	395	2521	87	75	2295	137
Presence of On-Street Parking	no		no	no		no	no		no	no		no
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	no
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	26.0
Offset Reference	LagFO
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	5	0	4	5	0	4	6	0	4	6	0
Maximum Green [s]	37	58	0	37	58	0	20	0	0	75	0	0
Amber [s]	3.0	4.3	0.0	3.0	4.3	0.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0	0.5	1.0	0.0
Split [s]	10	32	0	11	33	0	21	69	0	8	56	0
Vehicle Extension [s]	1.5	2.0	0.0	1.5	2.0	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Walk [s]	0	5	0	0	5	0	0	10	0	0	10	0
Pedestrian Clearance [s]	0	21	0	0	16	0	0	13	0	0	12	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	1.5	3.3	0.0	1.5	3.3	0.0	1.5	4.0	0.0	1.5	4.0	0.0
Minimum Recall	no	no		no	no		no	no		no	no	
Maximum Recall	no	no		no	no		no	yes		no	yes	
Pedestrian Recall	no	no		no	no		no	no		no	no	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Calculations

Lane Group	L	C	C	L	C	L	C	R	L	C	C
L, Total Lost Time per Cycle [s]	3.50	5.30	5.30	3.50	5.30	3.50	6.00	6.00	3.50	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.50	3.30	3.30	1.50	3.30	1.50	4.00	4.00	1.50	4.00	4.00
g_i, Effective Green Time [s]	7	27	27	8	28	18	63	63	5	50	50
g / C, Green / Cycle	0.05	0.22	0.22	0.06	0.23	0.15	0.53	0.53	0.04	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.07	0.03	0.03	0.09	0.35	0.22	0.71	0.05	0.04	0.65	0.67
s, saturation flow rate [veh/h]	1774	1863	1607	1774	1635	1774	3547	1583	1774	1863	1826
c, Capacity [veh/h]	96	412	356	111	375	259	1866	833	67	778	763
d1, Uniform Delay [s]	56.75	37.51	37.61	56.25	46.23	51.26	28.44	14.27	57.75	34.94	34.94
k, delay calibration	0.50	0.04	0.04	0.50	0.50	0.50	0.50	0.50	0.36	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	215.95	0.05	0.07	245.95	254.63	255.81	161.73	0.25	130.32	259.34	273.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.36	0.14	0.15	1.45	1.54	1.53	1.35	0.10	1.12	1.56	1.59
d, Delay for Lane Group [s/veh]	272.70	37.56	37.68	302.20	300.86	307.07	190.17	14.52	188.07	294.27	308.17
Lane Group LOS	F	D	D	F	F	F	F	B	F	F	F
Critical Lane Group	yes	no	no	no	yes	yes	no	no	no	no	yes
50th-Percentile Queue Length [veh]	8.61	1.29	1.21	10.86	37.32	25.93	66.01	1.19	4.36	76.66	78.11
50th-Percentile Queue Length [ft]	215.35	32.32	30.36	271.46	933.07	648.15	1650.36	29.65	109.10	1916.55	1952.84
95th-Percentile Queue Length [veh]	14.57	2.33	2.19	18.01	57.57	40.32	97.55	2.14	7.86	117.23	120.09
95th-Percentile Queue Length [ft]	364.33	58.18	54.64	450.22	1439.15	1008.02	2438.63	53.38	196.39	2930.84	3002.27

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	272.70	37.57	37.68	302.20	300.86	300.86	307.07	190.17	14.52	188.07	300.81	308.17
Movement LOS	F	D	D	F	F	F	F	F	B	F	F	F
d_A, Approach Delay [s/veh]	166.47			301.15			200.46			297.84		
Approach LOS	F			F			F			F		
d_I, Intersection Delay [s/veh]	248.29											
Intersection LOS	F											
Intersection V/C	1.315											

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX 8.3:

HORIZON YEAR (2035) WITHOUT PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM				
				TRAFFIC CONDITIONS			**2035 NP**
				CALC	DL	DATE	06/03/14
Jurisdiction:	**City of Jurupa Valley**			CHK	DL	DATE	06/03/14
Major Street:	**Pats Ranch Road**			Critical Approach Speed (Major)			35 mph
Minor Street:	**Ivory Street**			Critical Approach Speed (Minor)			25 mph

Major Street Approach Lanes = **2** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **13,336** vpd Minor Street Future ADT = **906** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1	*1*	8,000	5,600	2,400	1,680
2 + **13,336**	*1* **906**	9,600 *	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1	*1*	12,000	8,400	1,200	850
2 + **13,336**	*1* **906**	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX				
No one condition satisfied, but following conditions fulfilled 80% of more ….. **A** **38%** **B** **76%**		2 CONDITIONS 80%		2 CONDITIONS 80%	

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

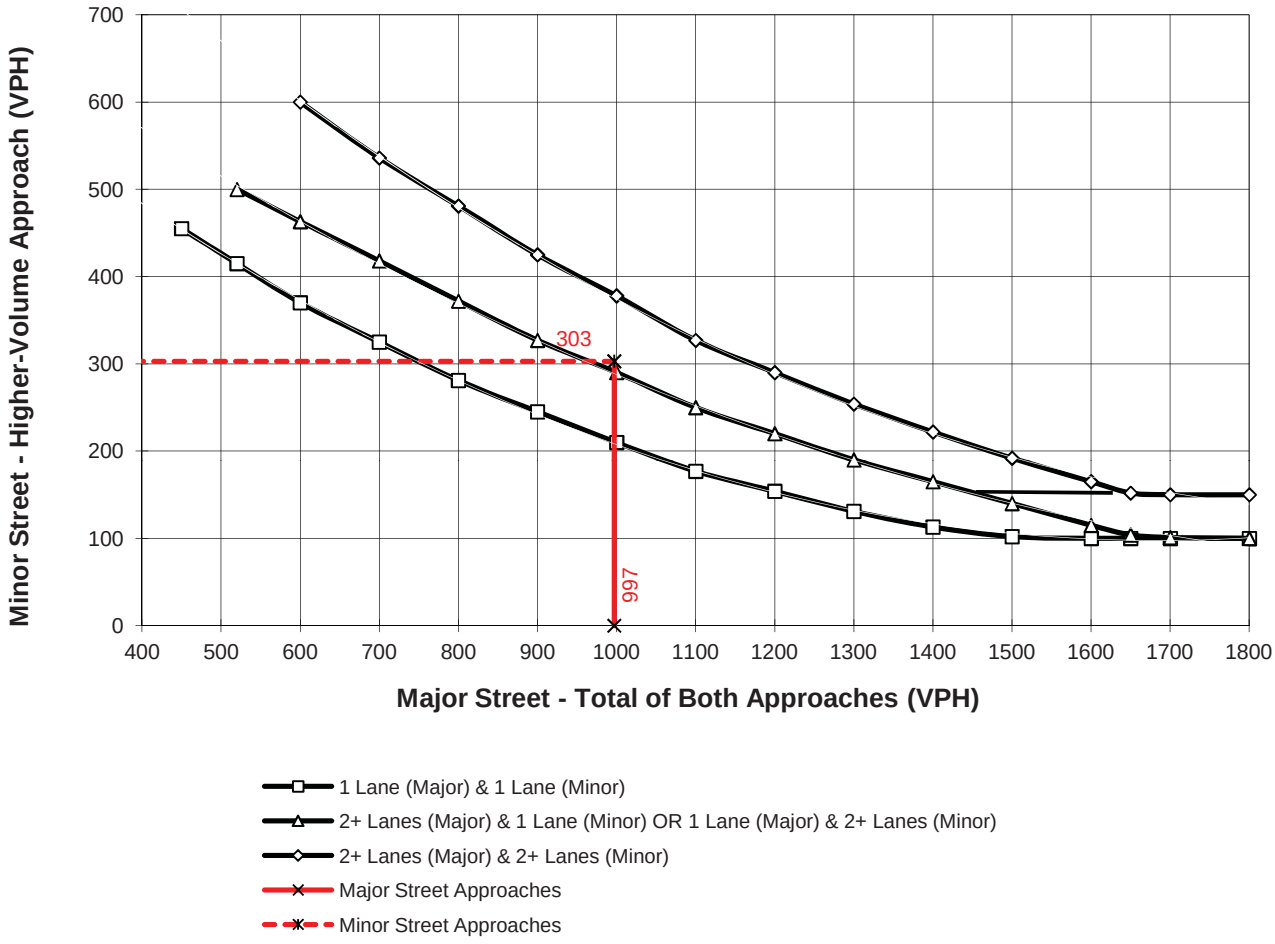
Figure 4C-3. Warrant 3, Peak Hour

Traffic Conditions = **Horizon Year (2035) Without Project Conditions - Weekday AM Peak Hour**

Major Street Name = **Pats Ranch Road**
Total of Both Approaches (VPH) = **997**
Number of Approach Lanes on Major Street = **2**

Minor Street Name = **Ivory Street**
High Volume Approach (VPH) = **303**
Number of Approach Lanes On Minor Street = **1**

WARRANTED FOR A SIGNAL



*Note: 150 vph applies as the lower threshold for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold for a minor-street approach with one lane

APPENDIX 8.4:

HORIZON YEAR (2035) WITH PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM				
				TRAFFIC CONDITIONS			**2035 WP**
				CALC	DL	DATE	06/03/14
Jurisdiction:	**City of Jurupa Valley**			CHK	DL	DATE	06/03/14
Major Street:	**Pats Ranch Road**			Critical Approach Speed (Major)			35 mph
Minor Street:	**Driveway 1**			Critical Approach Speed (Minor)			25 mph

Major Street Approach Lanes = **2** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **15,159** vpd Minor Street Future ADT = **607** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); …….. [ ]

or **URBAN (U)**

In built up area of isolated community of < 10,000 population …… [ ]

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1	*1*	8,000	5,600	2,400	1,680
2 + **15,159**	*1* **607**	9,600 *	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1	*1*	12,000	8,400	1,200	850
2 + **15,159**	*1* **607**	14,400 *	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS 80%		2 CONDITIONS 80%	
No one condition satisfied, but following conditions fulfilled 80% of more …..	**A** 25% **B** 51%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-103 (CA). Traffic Signal Warrants Worksheet (Average Traffic Estimate Form)

DIST	CO	RTE	PM				
				TRAFFIC CONDITIONS		2035 WP	
				CALC	DL	DATE	06/03/14
Jurisdiction:	City of Jurupa Valley			CHK	DL	DATE	06/03/14
Major Street:	Pats Ranch Road			Critical Approach Speed (Major)		35	mph
Minor Street:	Ivory Street			Critical Approach Speed (Minor)		25	mph

Major Street Approach Lanes = **2** lane Minor Street Approach Lanes = **1** lane

Major Street Future ADT = **14,341** vpd Minor Street Future ADT = **906** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……..

or

In built up area of isolated community of < 10,000 population ……

URBAN (U)

(Based on Estimated Average Daily Traffic - See Note)

URBAN	RURAL	Minimum Requirements EADT			
XX					
CONDITION A - Minimum Vehicular Volume		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1	*1*	8,000	5,600	2,400	1,680
2 + **14,341**	*1* **906**	9,600 *	6,720	2,400	1,680
2 +	*2* +	9,600	6,720	3,200	2,240
1	*2* +	8,000	5,600	3,200	2,240
CONDITION B - Interruption of Continuous Traffic		Vehicles Per Day on Major Street (Total of Both Approaches)		Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only)	
Satisfied	Not Satisfied				
	XX				
Number of lanes for moving traffic on each approach					
Major Street	Minor Street	Urban	Rural	Urban	Rural
1	*1*	12,000	8,400	1,200	850
2 + **14,341**	*1* **906**	14,400	10,080	1,200	850
2 +	*2* +	14,400	10,080	1,600	1,120
1	*2* +	12,000	8,400	1,600	1,120
Combination of CONDITIONS A + B					
Satisfied	Not Satisfied				
	XX	2 CONDITIONS		2 CONDITIONS	
No one condition satisfied, but following conditions fulfilled 80% of more …..	A / B	80%		80%	
	38% / 76%				

Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

APPENDIX 8.5:

HORIZON YEAR (2035) WITHOUT PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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Intersection: 33: I-15 SB Ramps & Limonite Av.

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	1240	1240	325	323	372	348	172	248	325	294
Average Queue (ft)	1207	1208	315	212	218	101	68	156	233	191
95th Queue (ft)	1229	1228	394	302	318	240	140	238	305	271
Link Distance (ft)	1184	1184				705	705		1101	
Upstream Blk Time (%)	50	65								
Queuing Penalty (veh)	0	0								
Storage Bay Dist (ft)			150	275	275			400		400
Storage Blk Time (%)		62	8	1	2					
Queuing Penalty (veh)		449	93	9	11					

Intersection: 34: I-15 NB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	145	148	231	340	1176	1176	325	309	365	306
Average Queue (ft)	80	73	44	47	1024	1008	313	185	238	180
95th Queue (ft)	128	123	141	174	1367	1391	391	277	322	275
Link Distance (ft)			705	705	1130	1130			1258	
Upstream Blk Time (%)					18	11				
Queuing Penalty (veh)					0	0				
Storage Bay Dist (ft)	300	300					150	450		450
Storage Blk Time (%)			0			39	13			
Queuing Penalty (veh)			0			282	116			

Network Summary

Network wide Queuing Penalty: 960

Intersection: 33: I-15 SB Ramps & Limonite Av.

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	1233	1238	325	226	248	322	304	366	449	435
Average Queue (ft)	1204	1205	314	150	158	137	141	255	326	270
95th Queue (ft)	1220	1223	401	211	229	234	250	342	417	373
Link Distance (ft)	1184	1184				705	705		1101	
Upstream Blk Time (%)	56	63								
Queuing Penalty (veh)	0	0								
Storage Bay Dist (ft)			150	275	275			400		400
Storage Blk Time (%)		55	1		0	0		0	1	0
Queuing Penalty (veh)		209	6		0	0		0	5	0

Intersection: 34: I-15 NB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	128	180	325	347	1173	1174	325	550	1306	550
Average Queue (ft)	52	70	138	151	1147	1145	279	536	1257	548
95th Queue (ft)	105	129	265	286	1159	1166	446	612	1405	562
Link Distance (ft)			705	705	1130	1130			1258	
Upstream Blk Time (%)					47	34			37	
Queuing Penalty (veh)					0	0			0	
Storage Bay Dist (ft)	300	300					150	450		450
Storage Blk Time (%)			0			43		15	63	61
Queuing Penalty (veh)			0			193		184	483	629

Network Summary

Network wide Queuing Penalty: 1710

APPENDIX 8.6:

HORIZON YEAR (2035) WITH PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS

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Intersection: 33: I-15 SB Ramps & Limonite Av.

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	1236	1247	325	321	350	400	192	266	328	286
Average Queue (ft)	1207	1211	322	216	225	101	73	158	238	188
95th Queue (ft)	1232	1235	364	310	318	239	148	243	308	261
Link Distance (ft)	1184	1184				705	705		1101	
Upstream Blk Time (%)	52	68								
Queuing Penalty (veh)	0	0								
Storage Bay Dist (ft)			150	275	275			400		400
Storage Blk Time (%)		64	10	1	2					
Queuing Penalty (veh)		459	108	8	14					

Intersection: 34: I-15 NB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	136	136	232	234	1174	1174	325	298	349	297
Average Queue (ft)	75	70	35	28	1091	1068	321	195	244	192
95th Queue (ft)	119	117	128	120	1297	1306	367	279	328	284
Link Distance (ft)			705	705	1130	1130			1258	
Upstream Blk Time (%)					17	11				
Queuing Penalty (veh)					0	0				
Storage Bay Dist (ft)	300	300					150	450		450
Storage Blk Time (%)			0			39	14			
Queuing Penalty (veh)			0			292	129			

Network Summary

Network wide Queuing Penalty: 1010

Intersection: 33: I-15 SB Ramps & Limonite Av.

Movement	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	L	LTR	R
Maximum Queue (ft)	1237	1237	325	233	247	291	253	439	516	459
Average Queue (ft)	1204	1205	299	149	158	131	135	263	339	287
95th Queue (ft)	1221	1224	424	209	224	221	220	373	443	397
Link Distance (ft)	1184	1184				705	705		1101	
Upstream Blk Time (%)	54	62								
Queuing Penalty (veh)	0	0								
Storage Bay Dist (ft)			150	275	275			400		400
Storage Blk Time (%)		56	1		0	0		0	1	0
Queuing Penalty (veh)		212	10		0	0		0	9	0

Intersection: 34: I-15 NB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	R	L	LTR	R
Maximum Queue (ft)	114	120	284	333	1175	1165	325	550	1304	550
Average Queue (ft)	55	67	122	142	1147	1146	294	542	1254	549
95th Queue (ft)	102	104	243	274	1160	1156	435	593	1419	553
Link Distance (ft)			705	705	1130	1130			1258	
Upstream Blk Time (%)					47	34			36	
Queuing Penalty (veh)					0	0			0	
Storage Bay Dist (ft)	300	300					150	450		450
Storage Blk Time (%)			0			43	0	19	63	62
Queuing Penalty (veh)			0			200	6	246	495	656

Network Summary

Network wide Queuing Penalty: 1835

APPENDIX 8.7:

HORIZON YEAR (2035) WITHOUT PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	2265	719	0	1248	909	0	0	0	277	2	494
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0.0	182.7	182.7	0.0	175.9	184.5				179.2	179.4	182.7
Adj Flow Rate, veh/h	0	2335	741	0	1287	937				287	0	509
Adj No. of Lanes	0	3	1	0	3	1				2	0	2
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	4	4	0	8	3				6	0	4
Cap, veh/h	0	3209	999	0	3090	1009				703	0	634
Arrive On Green	0.00	0.64	0.64	0.00	1.00	1.00				0.21	0.00	0.21
Sat Flow, veh/h	0	5152	1553	0	4961	1568				3414	0	3083
Grp Volume(v), veh/h	0	2335	741	0	1287	937				287	0	509
Grp Sat Flow(s),veh/h/ln	0	1663	1553	0	1601	1568				1707	0	1542
Q Serve(g_s), s	0.0	19.8	20.5	0.0	0.0	0.0				4.6	0.0	9.9
Cycle Q Clear(g_c), s	0.0	19.8	20.5	0.0	0.0	0.0				4.6	0.0	9.9
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3209	999	0	3090	1009				703	0	634
V/C Ratio(X)	0.00	0.73	0.74	0.00	0.42	0.93				0.41	0.00	0.80
Avail Cap(c_a), veh/h	0	3209	999	0	3090	1009				813	0	735
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	0.70	0.70				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	7.5	7.7	0.0	0.0	0.0				21.7	0.0	23.8
Incr Delay (d2), s/veh	0.0	0.7	2.7	0.0	0.3	11.9				0.4	0.0	5.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.1	9.4	0.0	0.1	3.3				2.2	0.0	4.7
LnGrp Delay(d),s/veh	0.0	8.3	10.3	0.0	0.3	11.9				22.1	0.0	29.4
LnGrp LOS		A	B		A	B				C		C
Approach Vol, veh/h		3076			2224						796	
Approach Delay, s/veh		8.8			5.2						26.8	
Approach LOS		A			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		45.0		18.0		45.0		
Change Period (Y+Rc), s		4.5		5.0		4.5		
Max Green Setting (Gmax), s		40.5		15.0		40.5		
Max Q Clear Time (g_c+I1), s		22.5		11.9		2.0		
Green Ext Time (p_c), s		16.8		1.1		33.6		

Intersection Summary	
HCM 2010 Ctrl Delay	9.8
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	2179	363	0	1751	722	433	5	415	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	0.0	179.2	182.7	0.0	181.0	182.7	174.3	174.6	181.0			
Adj Flow Rate, veh/h	0	2343	390	0	1883	776	470	0	446			
Adj No. of Lanes	0	3	1	0	3	1	2	0	2			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	0	6	4	0	5	4	9	0	5			
Cap, veh/h	0	2748	872	0	2774	870	971	0	899			
Arrive On Green	0.00	0.56	0.56	0.00	0.56	0.56	0.29	0.00	0.29			
Sat Flow, veh/h	0	5055	1553	0	5103	1549	3320	0	3076			
Grp Volume(v), veh/h	0	2343	390	0	1883	776	470	0	446			
Grp Sat Flow(s),veh/h/ln	0	1631	1553	0	1647	1549	1660	0	1538			
Q Serve(g_s), s	0.0	26.2	9.6	0.0	17.6	28.6	7.6	0.0	7.8			
Cycle Q Clear(g_c), s	0.0	26.2	9.6	0.0	17.6	28.6	7.6	0.0	7.8			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2748	872	0	2774	870	971	0	899			
V/C Ratio(X)	0.00	0.85	0.45	0.00	0.68	0.89	0.48	0.00	0.50			
Avail Cap(c_a), veh/h	0	2748	872	0	2774	870	971	0	899			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.66	0.66	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	12.0	8.3	0.0	10.1	12.5	19.0	0.0	19.0			
Incr Delay (d2), s/veh	0.0	2.4	1.1	0.0	1.4	13.4	1.7	0.0	2.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	12.1	4.3	0.0	8.2	15.3	3.7	0.0	3.5			
LnGrp Delay(d),s/veh	0.0	14.4	9.4	0.0	11.5	25.9	20.7	0.0	21.0			
LnGrp LOS		B	A		B	C	C		C			
Approach Vol, veh/h		2733			2659			916				
Approach Delay, s/veh		13.7			15.7			20.8				
Approach LOS		B			B			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		41.0				41.0		24.0
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		36.5				36.5		19.0
Max Q Clear Time (g_c+I1), s		28.2				30.6		9.8
Green Ext Time (p_c), s		8.1				5.8		2.6

Intersection Summary	
HCM 2010 Ctrl Delay	15.6
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Option 2: AM Improv

Number	89											
Intersection	Pats Ranch Road / Limonite Avenue											
Control Type	Signalized											
Analysis Method	HCM 2010											
Name	Pats Ranch Road						Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Base Volume Input [veh/h]	671	50	283	17	50	104	70	1189	197	359	1698	20
Total Analysis Volume [veh/h]	729	54	269	18	54	113	76	1291	168	390	1844	22

Intersection Settings

Cycle Length [s]	100											
Coordination Type	Time of Day Pattern Coordinated											
Actuation Type	Fully actuated											
Lost time [s]	0.00											
Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Overlap	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal Group	3	8	1	7	4	5	5	2	3	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	5	5	5	5	5	6	5	5	6	0
Maximum Green [s]	30	30	30	30	30	30	30	30	30	30	30	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	29	31	17	24	26	11	11	28	29	17	34	0
Walk [s]	0	7	0	0	0	0	0	11	0	0	0	0
Pedestrian Clearance [s]	0	20	0	0	0	0	0	13	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	no	no	no	no	no	no	no	no	no	no	no	
Maximum Recall	no	no	no	no	no	no	no	yes	no	no	yes	
Pedestrian Recall	no	no	no	no	no	no	no	no	no	no	no	

Lane Group Calculations

g / C, Green / Cycle	0.25	0.28	0.45	0.02	0.05	0.16	0.07	0.41	0.70	0.13	0.47	0.47
(v / s)_i Volume / Saturation Flow Rate	0.24	0.03	0.19	0.01	0.03	0.08	0.05	0.28	0.12	0.13	0.40	0.02
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Arrival type	5			5			5			5		
s, saturation flow rate [veh/h]	3101	1676	1425	1597	1676	1425	1597	4567	1425	3101	4567	1425
c, Capacity [veh/h]	770	473	645	33	91	235	113	1857	991	405	2130	665
X, volume / capacity	0.95	0.11	0.42	0.54	0.59	0.48	0.67	0.70	0.17	0.96	0.87	0.03
d, Delay for Lane Group [s/veh]	35.60	19.63	9.55	60.73	50.38	34.20	51.20	14.52	0.37	45.68	14.04	6.08
Lane Group LOS	D	B	A	E	D	C	D	B	A	D	B	A
Critical Lane Group	yes	no	no	no	no	yes	yes	no	no	no	yes	no
50th-Percentile Queue Length [veh]	7.40	0.70	1.96	0.54	1.36	2.15	1.94	3.93	0.10	4.46	4.44	0.12
50th-Percentile Queue Length [ft]	184.96	17.54	48.88	13.50	33.92	53.70	48.48	98.13	2.55	111.45	110.93	3.01
95th-Percentile Queue Length [veh]	11.86	1.26	3.52	0.97	2.44	3.87	3.49	7.07	0.18	7.92	7.89	0.22
95th-Percentile Queue Length [ft]	296.49	31.57	87.99	24.30	61.06	96.66	87.27	176.64	4.59	198.02	197.30	5.42

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	35.60	19.63	9.55	60.73	50.38	34.20	51.20	14.52	0.37	45.68	14.04	6.08
Movement LOS	D	B	A	E	D	C	D	B	A	D	B	A
Critical Movement	no	no	no	yes	no	no	no	no	no	no	no	no
d_A, Approach Delay [s/veh]	28.12			41.50			14.79			19.43		
Approach LOS	C			D			B			B		
d_I, Intersection Delay [s/veh]	20.64											
Intersection LOS	C											
Intersection V/C	0.754											

Option 1: AM Improvements

Number	93											
Intersection	Pats Ranch Road / 68th Street											
Control Type	Signalized											
Analysis Method	HCM 2010											
Name				Pats Ranch Road			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Base Volume Input [veh/h]	50	82	13	58	28	333	484	786	17	5	732	88
Total Analysis Volume [veh/h]	68	111	18	78	38	451	655	1064	23	7	991	119

Intersection Settings

Cycle Length [s]	75											
Coordination Type	Time of Day Pattern Coordinated											
Actuation Type	Fully actuated											
Lost time [s]	0.00											
Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	3	3	8	0	7	4	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	5	5	5	0	5	5	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	8	27	0	10	29	8	8	30	0	8	30	0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	no	no		no	no	no	no	no		no	no	
Maximum Recall	no	no		no	no	no	no	yes		no	yes	
Pedestrian Recall	no	no		no	no	no	no	no		no	no	

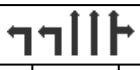
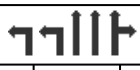
Lane Group Calculations

g / C, Green / Cycle	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00
(v / s)_i Volume / Saturation Flow Rate	0.04	0.08	0.50	0.02	0.32	1.51	0.32	0.33	0.02	0.31	0.08
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Arrival type	3		3			3			3		
s, saturation flow rate [veh/h]	1597	1636	157	1676	1425	435	1676	1664	397	3192	1425
c, Capacity [veh/h]	0	0	600	0	356	600	0	0	600	0	0
X, volume / capacity	0.00	0.00	0.13	0.00	1.27	1.09	0.00	0.00	0.01	0.00	0.00
d, Delay for Lane Group [s/veh]	0.00	0.00	6.45	0.00	144.71	70.20	0.00	0.00	6.01	0.00	0.00
Lane Group LOS	A	A	A	A	F	F	A	A	A	A	A
Critical Lane Group	no	no	no	no	yes	no	no	no	no	no	no
50th-Percentile Queue Length [veh]	0.00	0.00	0.11	0.00	13.88	12.84	0.00	0.00	0.00	0.00	0.00
50th-Percentile Queue Length [ft]	0.00	0.00	2.73	0.00	346.88	320.99	0.00	0.00	0.03	0.00	0.00
95th-Percentile Queue Length [veh]	0.00	0.00	0.20	0.00	22.43	18.72	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	4.91	0.00	560.79	467.91	0.00	0.00	0.06	0.00	0.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	6.45	0.00	144.71	70.20	0.00	0.00	6.01	0.00	0.00
Movement LOS	A	A	A	A	A	F	F	A	A	A	A	A
Critical Movement	no	no	no	no	no	yes	no	no	no	no	no	no
d_A, Approach Delay [s/veh]	0.00			115.99			26.40			0.04		
Approach LOS	A			F			C			A		
d_I, Intersection Delay [s/veh]	30.86											
Intersection LOS	C											
Intersection V/C	0.250											

Option 2: AM Improv

Number	94											
Intersection	Wineville Avenue / Limonite Avenue											
Control Type	Signalized											
Analysis Method	HCM 2010											
Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Base Volume Input [veh/h]	88	126	60	86	91	300	177	1244	68	33	1689	59
Total Analysis Volume [veh/h]	94	134	64	92	97	320	189	1326	47	35	1801	63

Intersection Settings

Cycle Length [s]	80											
Coordination Type	Time of Day Pattern Coordinated											
Actuation Type	Fully actuated											
Lost time [s]	0.00											
Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	5	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	5	0	4	5	4	4	6	0	4	6	0
Maximum Green [s]	37	58	0	37	58	20	20	0	0	75	0	0
Amber [s]	3.0	4.3	0.0	3.0	4.3	3.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	0.5	1.0	0.0	0.5	1.0	0.5	0.5	1.0	0.0	0.5	1.0	0.0
Split [s]	11	32	0	9	30	11	11	31	0	8	28	0
Walk [s]	0	5	0	0	5	0	0	10	0	0	10	0
Pedestrian Clearance [s]	0	21	0	0	16	0	0	13	0	0	12	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	no	no		no	no	no	no	no		no	no	
Maximum Recall	no	no		no	no	no	no	yes		no	yes	
Pedestrian Recall	no	no		no	no	no	no	no		no	no	

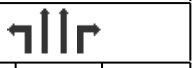
Lane Group Calculations

g / C, Green / Cycle	0.07	0.09	0.09	0.07	0.09	0.25	0.09	0.59	0.59	0.03	0.52	0.52
(v / s)_i Volume / Saturation Flow Rate	0.05	0.05	0.06	0.05	0.03	0.20	0.05	0.26	0.26	0.01	0.35	0.35
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Arrival type	3			3			3			3		
s, saturation flow rate [veh/h]	1774	1863	1667	1774	3547	1583	3445	3547	1830	3445	3547	1831
c, Capacity [veh/h]	123	169	151	120	316	394	323	2073	1070	100	1844	952
X, volume / capacity	0.77	0.60	0.64	0.77	0.31	0.81	0.58	0.44	0.44	0.35	0.67	0.67
d, Delay for Lane Group [s/veh]	40.40	36.37	36.84	48.19	34.42	44.87	35.47	9.97	10.59	38.96	16.07	17.86
Lane Group LOS	D	D	D	D	C	D	D	A	B	D	B	B
Critical Lane Group	yes	no	no	no	no	yes	yes	no	no	no	no	yes
50th-Percentile Queue Length [veh]	1.83	1.86	1.77	2.05	0.84	7.08	1.69	3.63	3.93	0.32	6.74	7.45
50th-Percentile Queue Length [ft]	45.75	46.44	44.25	51.20	21.05	177.04	42.20	90.64	98.21	8.05	168.62	186.22
95th-Percentile Queue Length [veh]	3.29	3.34	3.19	3.69	1.52	11.45	3.04	6.53	7.07	0.58	11.00	11.92
95th-Percentile Queue Length [ft]	82.35	83.59	79.65	92.16	37.89	286.15	75.95	163.15	176.79	14.49	275.10	298.12

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	40.40	36.48	36.84	48.19	34.42	44.87	35.47	10.16	10.59	38.96	16.64	17.86
Movement LOS	D	D	D	D	C	D	D	B	B	D	B	B
Critical Movement	no	no	no	yes	no	no	no	no	no	no	no	no
d_A, Approach Delay [s/veh]	37.82			43.48			13.24			17.09		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	20.25											
Intersection LOS	C											
Intersection V/C	0.610											

Option 1: Mid-Day Improvements

Number	93											
Intersection	Pats Ranch Road / 68th Street											
Control Type	Signalized											
Analysis Method	HCM 2010											
Name	Pats Ranch Road			Pats Ranch Road			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Base Volume Input [veh/h]	33	54	9	163	93	399	341	493	57	15	599	183
Total Analysis Volume [veh/h]	49	80	13	240	93	588	503	727	57	15	883	270

Intersection Settings

Cycle Length [s]	120											
Coordination Type	Time of Day Pattern Coordinated											
Actuation Type	Fully actuated											
Lost time [s]	0.00											
Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	3	3	8	0	7	4	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	5	5	5	0	5	5	0
Maximum Green [s]	50	50	0	50	50	50	50	50	0	50	50	0
Amber [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	27	0	21	39	38	38	64	0	8	34	0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	no	no		no	no	no	no	no		no	no	
Maximum Recall	no	no		no	no	no	no	yes		no	yes	
Pedestrian Recall	no	no		no	no	no	no	no		no	no	

Lane Group Calculations

g / C, Green / Cycle	0.04	0.07	0.17	0.20	0.55	0.33	0.66	0.66	0.02	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.03	0.06	0.15	0.06	0.41	0.32	0.24	0.24	0.01	0.28	0.19
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Arrival type	3		3			3			3		
s, saturation flow rate [veh/h]	1597	1636	1597	1676	1425	1597	1676	1634	1597	3192	1425
c, Capacity [veh/h]	62	115	265	330	784	530	1114	1086	25	1111	496
X, volume / capacity	0.79	0.81	0.91	0.28	0.75	0.95	0.36	0.36	0.59	0.79	0.54
d, Delay for Lane Group [s/veh]	87.63	78.55	69.91	49.48	31.24	71.53	11.48	11.52	90.12	48.08	41.90
Lane Group LOS	F	E	E	D	C	E	B	B	F	D	D
Critical Lane Group	yes	no	no	no	yes	yes	no	no	no	yes	no
50th-Percentile Queue Length [veh]	2.13	3.80	9.33	2.89	16.26	20.58	5.36	5.25	0.68	14.58	8.04
50th-Percentile Queue Length [ft]	53.35	94.92	233.24	72.18	406.52	514.44	134.01	131.25	17.01	364.41	201.11
95th-Percentile Queue Length [veh]	3.84	6.83	14.34	5.20	22.87	28.02	9.16	9.01	1.22	20.84	12.70
95th-Percentile Queue Length [ft]	96.02	170.85	358.47	129.92	571.85	700.42	228.93	225.19	30.62	520.95	317.40

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	87.63	78.55	78.55	69.91	49.48	31.24	71.53	11.50	11.52	90.12	48.08	41.90
Movement LOS	F	E	E	E	D	C	E	B	B	F	D	D
Critical Movement	no	no	no	no	no	no	no	no	no	yes	no	no
d_A, Approach Delay [s/veh]	81.68			43.16			34.96			47.19		
Approach LOS	F			D			C			D		
d_I, Intersection Delay [s/veh]	43.05											
Intersection LOS	D											
Intersection V/C	0.840											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1898	379	0	2276	707	0	0	0	518	0	628
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0.0	186.3	186.3	0.0	186.3	188.1				186.3	186.3	186.3
Adj Flow Rate, veh/h	0	1998	399	0	2396	744				545	0	661
Adj No. of Lanes	0	3	1	0	3	1				2	0	2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	0	2	1				2	0	2
Cap, veh/h	0	3054	951	0	3054	960				973	0	863
Arrive On Green	0.00	0.60	0.60	0.00	1.00	1.00				0.27	0.00	0.27
Sat Flow, veh/h	0	5253	1583	0	5253	1599				3548	0	3149
Grp Volume(v), veh/h	0	1998	399	0	2396	744				545	0	661
Grp Sat Flow(s),veh/h/ln	0	1695	1583	0	1695	1599				1774	0	1575
Q Serve(g_s), s	0.0	19.6	10.2	0.0	0.0	0.0				10.0	0.0	14.6
Cycle Q Clear(g_c), s	0.0	19.6	10.2	0.0	0.0	0.0				10.0	0.0	14.6
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3054	951	0	3054	960				973	0	863
V/C Ratio(X)	0.00	0.65	0.42	0.00	0.78	0.77				0.56	0.00	0.77
Avail Cap(c_a), veh/h	0	3054	951	0	3054	960				1405	0	1247
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	0.27	0.27				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	10.0	8.1	0.0	0.0	0.0				23.6	0.0	25.3
Incr Delay (d2), s/veh	0.0	0.4	0.1	0.0	0.6	1.7				0.5	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.2	4.5	0.0	0.2	0.5				4.9	0.0	6.5
LnGrp Delay(d),s/veh	0.0	10.4	8.2	0.0	0.6	1.7				24.1	0.0	27.0
LnGrp LOS		B	A		A	A				C		C
Approach Vol, veh/h		2397			3140						1206	
Approach Delay, s/veh		10.0			0.9						25.7	
Approach LOS		B			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		50.0		25.8		50.0		
Change Period (Y+Rc), s		4.5		5.0		4.5		
Max Green Setting (Gmax), s		45.5		30.0		45.5		
Max Q Clear Time (g_c+I1), s		21.6		16.6		2.0		
Green Ext Time (p_c), s		22.6		4.2		39.4		

Intersection Summary	
HCM 2010 Ctrl Delay	8.6
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	2244	192	0	2501	447	537	1	995	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	0.0	186.3	184.5	0.0	188.1	188.1	186.3	186.3	188.1			
Adj Flow Rate, veh/h	0	2338	200	0	2605	466	560	0	1036			
Adj No. of Lanes	0	3	1	0	3	1	2	0	2			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	0	2	3	0	1	1	2	0	1			
Cap, veh/h	0	2662	821	0	2689	835	1294	0	1166			
Arrive On Green	0.00	0.52	0.52	0.00	0.52	0.52	0.36	0.00	0.36			
Sat Flow, veh/h	0	5253	1568	0	5305	1594	3548	0	3198			
Grp Volume(v), veh/h	0	2338	200	0	2605	466	560	0	1036			
Grp Sat Flow(s),veh/h/ln	0	1695	1568	0	1712	1594	1774	0	1599			
Q Serve(g_s), s	0.0	34.5	5.9	0.0	41.7	16.7	10.1	0.0	25.9			
Cycle Q Clear(g_c), s	0.0	34.5	5.9	0.0	41.7	16.7	10.1	0.0	25.9			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2662	821	0	2689	835	1294	0	1166			
V/C Ratio(X)	0.00	0.88	0.24	0.00	0.97	0.56	0.43	0.00	0.89			
Avail Cap(c_a), veh/h	0	2662	821	0	2689	835	1294	0	1166			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.74	0.74	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	17.9	11.1	0.0	19.6	13.6	20.4	0.0	25.4			
Incr Delay (d2), s/veh	0.0	3.4	0.5	0.0	11.5	2.7	1.1	0.0	10.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	16.9	2.7	0.0	22.4	7.9	5.1	0.0	13.0			
LnGrp Delay(d),s/veh	0.0	21.2	11.6	0.0	31.0	16.3	21.4	0.0	35.6			
LnGrp LOS		C	B		C	B	C		D			
Approach Vol, veh/h		2538			3071			1596				
Approach Delay, s/veh		20.5			28.8			30.6				
Approach LOS		C			C			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		49.0				49.0		36.0
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		44.5				44.5		31.0
Max Q Clear Time (g_c+I1), s		36.5				43.7		27.9
Green Ext Time (p_c), s		7.9				0.8		2.0

Intersection Summary	
HCM 2010 Ctrl Delay	26.3
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	40.40	36.48	36.84	48.19	34.42	44.87	35.47	9.86	7.24	38.96	16.64	17.86
Movement LOS	D	D	D	D	C	D	D	A	A	D	B	B
Critical Movement	no	no	no	yes	no	no	no	no	no	no	no	no
d_A, Approach Delay [s/veh]	37.82			43.48			12.88			17.09		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	20.12											
Intersection LOS	C											
Intersection V/C	0.610											

Option 2: PM Improv

Number	89											
Intersection	Pats Ranch Road / Limonite Avenue											
Control Type	Signalized											
Analysis Method	HCM 2010											
Name	Pats Ranch Road						Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Base Volume Input [veh/h]	589	100	427	50	100	163	110	2316	575	419	2197	21
Total Analysis Volume [veh/h]	629	107	388	53	107	174	118	2474	521	448	2347	22

Intersection Settings

Cycle Length [s]	110											
Coordination Type	Time of Day Pattern Coordinated											
Actuation Type	Fully actuated											
Lost time [s]	0.00											
Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Overlap	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal Group	3	8	1	7	4	5	5	2	3	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	5	5	5	5	5	6	5	5	6	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	24	23	18	13	12	13	13	56	24	18	61	0
Walk [s]	0	0	0	0	0	0	0	11	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	13	0	0	0	0
l1, Start-Up Lost Time [s]	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Minimum Recall	no	no	no	no	no	no	no	no	no	no	no	
Maximum Recall	no	no	no	no	no	no	no	yes	no	no	yes	
Pedestrian Recall	no	no	no	no	no	no	no	no	no	no	no	

Lane Group Calculations

g / C, Green / Cycle	0.19	0.23	0.39	0.05	0.08	0.20	0.09	0.48	0.70	0.14	0.53	0.53
(v / s)_i Volume / Saturation Flow Rate	0.20	0.06	0.27	0.03	0.06	0.12	0.07	0.54	0.37	0.14	0.51	0.02
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Arrival type	5			5			5			5		
s, saturation flow rate [veh/h]	3101	1676	1425	1597	1676	1425	1597	4567	1425	3101	4567	1425
c, Capacity [veh/h]	588	376	540	72	134	270	145	2213	987	422	2421	755
X, volume / capacity	1.07	0.28	0.72	0.73	0.80	0.65	0.81	1.12	0.53	1.06	0.97	0.03
d, Delay for Lane Group [s/veh]	76.95	28.59	23.74	63.34	64.28	45.34	66.99	70.41	2.78	74.72	18.10	3.09
Lane Group LOS	F	C	C	E	E	D	E	F	A	F	B	A
Critical Lane Group	yes	no	no	no	no	yes	no	yes	no	yes	no	no
50th-Percentile Queue Length [veh]	9.95	1.91	5.40	1.61	3.26	4.24	3.72	16.38	0.98	6.80	5.21	0.07
50th-Percentile Queue Length [ft]	248.80	47.80	134.95	40.26	81.52	106.01	92.99	409.51	24.48	170.04	130.16	1.86
95th-Percentile Queue Length [veh]	15.63	3.44	9.21	2.90	5.87	7.62	6.70	24.85	1.76	11.35	8.95	0.13
95th-Percentile Queue Length [ft]	390.77	86.04	230.21	72.46	146.74	190.44	167.38	621.16	44.06	283.76	223.72	3.36

Option 2: PM Improv

Number	93											
Intersection	Pats Ranch Road / 68th Street											
Control Type	Signalized											
Analysis Method	HCM 2010											
Name	Pats Ranch Road			Pats Ranch Road			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Base Volume Input [veh/h]	33	54	9	92	93	403	345	453	57	15	408	60
Total Analysis Volume [veh/h]	39	64	11	108	110	475	407	534	67	18	481	71

Intersection Settings

Cycle Length [s]	60											
Coordination Type	Time of Day Pattern Coordinated											
Actuation Type	Fully actuated											
Lost time [s]	0.00											
Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	3	3	8	0	7	4	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	5	5	5	0	5	5	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	15	0	17	23	9	9	19	0	9	19	0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	no	no		no	no	no	no	no		no	no	
Maximum Recall	no	no		no	no	no	no	no		no	no	
Pedestrian Recall	no	no		no	no	no	no	no		no	no	

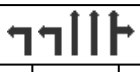
Lane Group Calculations

g / C, Green / Cycle	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00
(v / s)_i Volume / Saturation Flow Rate	0.02	0.05	0.25	0.07	0.33	0.59	0.18	0.18	0.03	0.15	0.05
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Arrival type	3		3			3			3		
s, saturation flow rate [veh/h]	1597	1634	435	1676	1425	690	1676	1612	617	3192	1425
c, Capacity [veh/h]	0	0	450	0	356	450	0	0	450	0	0
X, volume / capacity	0.00	0.00	0.24	0.00	1.33	0.90	0.00	0.00	0.04	0.00	0.00
d, Delay for Lane Group [s/veh]	0.00	0.00	9.26	0.00	174.04	32.22	0.00	0.00	8.04	0.00	0.00
Lane Group LOS	A	A	A	A	F	C	A	A	A	A	A
Critical Lane Group	no	no	no	no	yes	no	no	no	no	no	no
50th-Percentile Queue Length [veh]	0.00	0.00	0.35	0.00	16.73	3.90	0.00	0.00	0.02	0.00	0.00
50th-Percentile Queue Length [ft]	0.00	0.00	8.72	0.00	418.37	97.49	0.00	0.00	0.52	0.00	0.00
95th-Percentile Queue Length [veh]	0.00	0.00	0.63	0.00	26.93	7.02	0.00	0.00	0.04	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	15.70	0.00	673.14	175.48	0.00	0.00	0.94	0.00	0.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	9.26	0.00	174.04	32.22	0.00	0.00	8.04	0.00	0.00
Movement LOS	A	A	A	A	A	F	C	A	A	A	A	A
Critical Movement	no	no	no	no	no	yes	no	no	no	no	no	no
d_A, Approach Delay [s/veh]	0.00			120.73			13.01			0.25		
Approach LOS	A			F			B			A		
d_I, Intersection Delay [s/veh]	40.64											
Intersection LOS	D											
Intersection V/C	0.250											

Option 2: PM Improv

Number	94											
Intersection	Wineville Avenue / Limonite Avenue											
Control Type	Signalized											
Analysis Method	HCM 2010											
Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Base Volume Input [veh/h]	121	56	43	149	112	421	365	2314	112	69	2094	126
Total Analysis Volume [veh/h]	131	61	47	161	121	456	395	2507	87	75	2269	137

Intersection Settings

Cycle Length [s]	100											
Coordination Type	Time of Day Pattern Coordinated											
Actuation Type	Fully actuated											
Lost time [s]	0.00											
Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	5	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	5	0	4	5	4	4	6	0	4	6	0
Maximum Green [s]	37	58	0	37	58	20	20	0	0	75	0	0
Amber [s]	3.0	4.3	0.0	3.0	4.3	3.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	0.5	1.0	0.0	0.5	1.0	0.5	0.5	1.0	0.0	0.5	1.0	0.0
Split [s]	12	32	0	19	39	15	15	41	0	8	34	0
Walk [s]	0	5	0	0	5	0	0	10	0	0	10	0
Pedestrian Clearance [s]	0	21	0	0	16	0	0	13	0	0	12	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	no	no		no	no	no	no	no		no	no	
Maximum Recall	no	no		no	no	no	no	yes		no	yes	
Pedestrian Recall	no	no		no	no	no	no	no		no	no	

Lane Group Calculations

g / C, Green / Cycle	0.09	0.11	0.11	0.11	0.14	0.30	0.11	0.56	0.56	0.04	0.48	0.48
(v / s)_i Volume / Saturation Flow Rate	0.07	0.03	0.03	0.09	0.03	0.29	0.11	0.48	0.49	0.02	0.45	0.45
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Arrival type	3			3			3			3		
s, saturation flow rate [veh/h]	1774	1863	1607	1774	3547	1583	3445	3547	1831	3445	3547	1809
c, Capacity [veh/h]	152	210	181	194	484	482	396	1978	1021	130	1704	869
X, volume / capacity	0.86	0.27	0.29	0.83	0.25	0.95	1.00	0.86	0.87	0.58	0.93	0.94
d, Delay for Lane Group [s/veh]	72.53	40.90	41.08	49.82	38.77	63.66	56.48	23.99	29.52	48.89	35.00	44.29
Lane Group LOS	E	D	D	D	D	E	E	C	C	D	D	D
Critical Lane Group	yes	no	no	no	no	yes	yes	no	no	no	no	yes
50th-Percentile Queue Length [veh]	4.24	1.23	1.15	4.09	1.29	14.07	5.36	15.64	18.13	0.90	17.44	20.36
50th-Percentile Queue Length [ft]	106.05	30.70	28.87	102.13	32.19	351.71	134.08	391.12	453.28	22.48	435.90	509.06
95th-Percentile Queue Length [veh]	7.62	2.21	2.08	7.35	2.32	20.22	9.16	22.13	25.11	1.62	24.28	27.76
95th-Percentile Queue Length [ft]	190.49	55.26	51.97	183.83	57.93	505.49	229.03	553.29	627.86	40.46	607.10	694.08

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	72.53	40.92	41.08	49.82	38.77	63.66	56.48	25.77	29.52	48.89	37.80	44.29
Movement LOS	E	D	D	D	D	E	E	C	C	D	D	D
Critical Movement	yes	no	no	no	no	no	no	no	no	no	no	no
d_A, Approach Delay [s/veh]	58.28			56.56			29.94			38.49		
Approach LOS	E			E			C			D		
d_I, Intersection Delay [s/veh]	37.33											
Intersection LOS	D											
Intersection V/C	0.831											

APPENDIX 8.8:

HORIZON YEAR (2035) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	2269	719	0	1264	942	0	0	0	285	2	494
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0.0	182.7	182.7	0.0	175.9	184.5				179.2	179.4	182.7
Adj Flow Rate, veh/h	0	2339	741	0	1303	971				295	0	509
Adj No. of Lanes	0	3	1	0	3	1				2	0	2
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	4	4	0	8	3				6	0	4
Cap, veh/h	0	3208	999	0	3089	1009				703	0	635
Arrive On Green	0.00	0.64	0.64	0.00	1.00	1.00				0.21	0.00	0.21
Sat Flow, veh/h	0	5152	1553	0	4961	1568				3414	0	3083
Grp Volume(v), veh/h	0	2339	741	0	1303	971				295	0	509
Grp Sat Flow(s),veh/h/ln	0	1663	1553	0	1601	1568				1707	0	1542
Q Serve(g_s), s	0.0	19.8	20.5	0.0	0.0	0.0				4.7	0.0	9.9
Cycle Q Clear(g_c), s	0.0	19.8	20.5	0.0	0.0	0.0				4.7	0.0	9.9
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3208	999	0	3089	1009				703	0	635
V/C Ratio(X)	0.00	0.73	0.74	0.00	0.42	0.96				0.42	0.00	0.80
Avail Cap(c_a), veh/h	0	3208	999	0	3089	1009				813	0	734
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	0.68	0.68				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	7.5	7.7	0.0	0.0	0.0				21.7	0.0	23.8
Incr Delay (d2), s/veh	0.0	0.8	2.7	0.0	0.3	16.0				0.4	0.0	5.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.1	9.4	0.0	0.1	4.5				2.3	0.0	4.7
LnGrp Delay(d),s/veh	0.0	8.3	10.3	0.0	0.3	16.0				22.1	0.0	29.4
LnGrp LOS		A	B		A	B				C		C
Approach Vol, veh/h		3080			2274						804	
Approach Delay, s/veh		8.8			7.0						26.7	
Approach LOS		A			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		45.0		18.0		45.0		
Change Period (Y+Rc), s		4.5		5.0		4.5		
Max Green Setting (Gmax), s		40.5		15.0		40.5		
Max Q Clear Time (g_c+I1), s		22.5		11.9		2.0		
Green Ext Time (p_c), s		16.9		1.1		33.8		

Intersection Summary	
HCM 2010 Ctrl Delay	10.5
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	2191	363	0	1800	755	433	5	423	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	0.0	179.2	182.7	0.0	181.0	182.7	174.3	174.6	181.0			
Adj Flow Rate, veh/h	0	2356	390	0	1935	812	470	0	455			
Adj No. of Lanes	0	3	1	0	3	1	2	0	2			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	0	6	4	0	5	4	9	0	5			
Cap, veh/h	0	2748	872	0	2774	870	971	0	899			
Arrive On Green	0.00	0.56	0.56	0.00	0.56	0.56	0.29	0.00	0.29			
Sat Flow, veh/h	0	5055	1553	0	5103	1549	3320	0	3076			
Grp Volume(v), veh/h	0	2356	390	0	1935	812	470	0	455			
Grp Sat Flow(s),veh/h/ln	0	1631	1553	0	1647	1549	1660	0	1538			
Q Serve(g_s), s	0.0	26.5	9.6	0.0	18.4	31.4	7.6	0.0	8.0			
Cycle Q Clear(g_c), s	0.0	26.5	9.6	0.0	18.4	31.4	7.6	0.0	8.0			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2748	872	0	2774	870	971	0	899			
V/C Ratio(X)	0.00	0.86	0.45	0.00	0.70	0.93	0.48	0.00	0.51			
Avail Cap(c_a), veh/h	0	2748	872	0	2774	870	971	0	899			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.66	0.66	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	12.0	8.3	0.0	10.3	13.1	19.0	0.0	19.1			
Incr Delay (d2), s/veh	0.0	2.5	1.1	0.0	1.5	18.1	1.7	0.0	2.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	12.4	4.3	0.0	8.6	17.5	3.7	0.0	3.6			
LnGrp Delay(d),s/veh	0.0	14.5	9.4	0.0	11.8	31.3	20.7	0.0	21.1			
LnGrp LOS		B	A		B	C	C		C			
Approach Vol, veh/h		2746			2747			925				
Approach Delay, s/veh		13.8			17.5			20.9				
Approach LOS		B			B			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		41.0				41.0		24.0
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		36.5				36.5		19.0
Max Q Clear Time (g_c+I1), s		28.5				33.4		10.0
Green Ext Time (p_c), s		7.9				3.1		2.6

Intersection Summary	
HCM 2010 Ctrl Delay	16.4
HCM 2010 LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Option 3: AM Improv

Number	89											
Intersection	Pats Ranch Road / Limonite Avenue											
Control Type	Signalized											
Analysis Method	HCM 2010											
Name	Pats Ranch Road			Pats Ranch Road			Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Base Volume Input [veh/h]	671	50	283	17	50	104	70	1189	197	359	1698	20
Total Analysis Volume [veh/h]	819	54	295	18	54	113	76	1291	190	396	1844	22

Intersection Settings

Cycle Length [s]	115											
Coordination Type	Time of Day Pattern Coordinated											
Actuation Type	Fully actuated											
Lost time [s]	0.00											
Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Overlap	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal Group	3	8	1	7	4	5	5	2	3	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	5	5	5	5	5	6	5	5	6	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	35	31	19	37	33	11	11	28	35	19	36	0
Walk [s]	0	7	0	0	0	0	0	11	0	0	0	0
Pedestrian Clearance [s]	0	20	0	0	0	0	0	13	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	no	no	no	no	no	no	no	no	no	no	no	
Maximum Recall	no	no	no	no	no	no	no	yes	no	no	yes	
Pedestrian Recall	no	no	no	no	no	no	no	no	no	no	no	

Lane Group Calculations

g / C, Green / Cycle	0.27	0.30	0.47	0.02	0.05	0.15	0.06	0.41	0.71	0.13	0.48	0.48
(v / s)_i Volume / Saturation Flow Rate	0.26	0.03	0.21	0.01	0.03	0.08	0.05	0.28	0.13	0.13	0.40	0.02
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Arrival type	5			5			5			5		
s, saturation flow rate [veh/h]	3101	1676	1425	1597	1676	1425	1597	4567	1425	3101	4567	1425
c, Capacity [veh/h]	833	504	664	30	86	209	97	1875	1017	404	2193	684
X, volume / capacity	0.98	0.11	0.44	0.59	0.63	0.54	0.78	0.69	0.19	0.98	0.84	0.03
d, Delay for Lane Group [s/veh]	42.69	20.62	9.91	72.40	58.80	42.17	72.00	15.85	0.41	53.60	12.91	6.09
Lane Group LOS	D	C	A	E	E	D	E	B	A	D	B	A
Critical Lane Group	yes	no	no	no	no	yes	yes	no	no	no	yes	no
50th-Percentile Queue Length [veh]	10.39	0.77	2.27	0.64	1.60	2.65	2.58	4.52	0.11	5.37	4.50	0.13
50th-Percentile Queue Length [ft]	259.71	19.23	56.76	15.98	39.96	66.20	64.58	113.05	2.87	134.16	112.48	3.20
95th-Percentile Queue Length [veh]	15.67	1.38	4.09	1.15	2.88	4.77	4.65	8.01	0.21	9.17	7.98	0.23
95th-Percentile Queue Length [ft]	391.85	34.61	102.18	28.77	71.92	119.16	116.24	200.23	5.16	229.14	199.45	5.76

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	42.69	20.62	9.91	72.40	58.80	42.17	72.00	15.85	0.41	53.60	12.91	6.09
Movement LOS	D	C	A	E	E	D	E	B	A	D	B	A
Critical Movement	no	no	no	yes	no	no	no	no	no	no	no	no
d_A, Approach Delay [s/veh]	33.39			49.97			16.70			19.97		
Approach LOS	C			D			B			B		
d_I, Intersection Delay [s/veh]	23.09											
Intersection LOS	C											
Intersection V/C	0.784											

Option 3: AM Improv

Number	93											
Intersection	Pats Ranch Road / 68th Street											
Control Type	Signalized											
Analysis Method	HCM 2010											
Name				Pats Ranch Road			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Base Volume Input [veh/h]	50	82	13	58	28	333	484	786	17	5	732	88
Total Analysis Volume [veh/h]	68	111	18	89	38	505	668	1064	23	7	991	122

Intersection Settings

Cycle Length [s]	60											
Coordination Type	Time of Day Pattern Coordinated											
Actuation Type	Fully actuated											
Lost time [s]	0.00											
Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	3	3	8	0	7	4	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	5	5	5	0	5	5	0
Maximum Green [s]	40	40	0	40	40	40	40	40	0	40	40	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	19	0	9	19	13	13	23	0	9	19	0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	no	no		no	no	no	no	no		no	no	
Maximum Recall	no	no		no	no	no	no	no		no	no	
Pedestrian Recall	no	no		no	no	no	no	no		no	no	

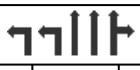
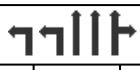
Lane Group Calculations

g / C, Green / Cycle	0.05	0.12	0.07	0.14	0.52	0.34	0.66	0.66	0.01	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.04	0.08	0.06	0.02	0.35	0.42	0.32	0.33	0.00	0.31	0.09
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Arrival type	3		3			3			3		
s, saturation flow rate [veh/h]	1597	1636	1597	1676	1425	1597	1676	1664	1597	3192	1425
c, Capacity [veh/h]	86	203	111	234	735	546	1108	1100	14	1047	467
X, volume / capacity	0.79	0.64	0.80	0.16	0.69	1.22	0.49	0.49	0.49	0.95	0.26
d, Delay for Lane Group [s/veh]	69.68	51.99	66.20	44.59	26.33	154.92	11.28	11.33	81.08	43.63	29.15
Lane Group LOS	E	D	E	D	C	F	B	B	F	D	C
Critical Lane Group	yes	no	no	no	yes	yes	no	no	no	yes	no
50th-Percentile Queue Length [veh]	2.35	3.80	2.94	0.99	10.92	32.43	6.41	6.41	0.29	13.90	2.48
50th-Percentile Queue Length [ft]	58.82	94.99	73.61	24.68	272.96	810.79	160.22	160.35	7.37	347.62	61.88
95th-Percentile Queue Length [veh]	4.24	6.84	5.30	1.78	16.34	47.32	10.56	10.57	0.53	20.02	4.46
95th-Percentile Queue Length [ft]	105.88	170.99	132.51	44.42	408.44	1183.11	264.01	264.18	13.27	500.51	111.38

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	69.68	51.99	51.99	66.20	44.59	26.33	154.92	11.30	11.33	81.08	43.63	29.15
Movement LOS	E	D	D	E	D	C	F	B	B	F	D	C
Critical Movement	no	no	no	no	no	no	yes	no	no	no	no	no
d_A, Approach Delay [s/veh]	58.09			33.04			65.97			42.29		
Approach LOS	E			C			E			D		
d_I, Intersection Delay [s/veh]	52.77											
Intersection LOS	D											
Intersection V/C	0.945											

Option 3: AM Improv

Number	94											
Intersection	Wineville Avenue / Limonite Avenue											
Control Type	Signalized											
Analysis Method	HCM 2010											
Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Base Volume Input [veh/h]	88	126	60	86	91	300	177	1244	68	33	1689	59
Total Analysis Volume [veh/h]	94	134	64	92	97	320	189	1326	47	35	1801	63

Intersection Settings

Cycle Length [s]	80											
Coordination Type	Time of Day Pattern Coordinated											
Actuation Type	Fully actuated											
Lost time [s]	0.00											
Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	5	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	5	0	4	5	4	4	6	0	4	6	0
Maximum Green [s]	37	58	0	37	58	20	20	0	0	75	0	0
Amber [s]	3.0	4.3	0.0	3.0	4.3	3.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	0.5	1.0	0.0	0.5	1.0	0.5	0.5	1.0	0.0	0.5	1.0	0.0
Split [s]	11	32	0	9	30	11	11	31	0	8	28	0
Walk [s]	0	5	0	0	5	0	0	10	0	0	10	0
Pedestrian Clearance [s]	0	21	0	0	16	0	0	13	0	0	12	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	no	no		no	no	no	no	no		no	no	
Maximum Recall	no	no		no	no	no	no	yes		no	yes	
Pedestrian Recall	no	no		no	no	no	no	no		no	no	

Lane Group Calculations

g / C, Green / Cycle	0.07	0.09	0.09	0.07	0.09	0.25	0.09	0.59	0.59	0.03	0.52	0.52
(v / s)_i Volume / Saturation Flow Rate	0.05	0.05	0.06	0.05	0.03	0.20	0.05	0.26	0.26	0.01	0.35	0.35
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Arrival type	3			3			3			3		
s, saturation flow rate [veh/h]	1774	1863	1667	1774	3547	1583	3445	3547	1830	3445	3547	1831
c, Capacity [veh/h]	123	169	151	120	316	394	323	2073	1070	100	1844	952
X, volume / capacity	0.77	0.60	0.64	0.77	0.31	0.81	0.58	0.44	0.44	0.35	0.67	0.67
d, Delay for Lane Group [s/veh]	40.40	36.37	36.84	48.19	34.42	44.87	35.47	9.97	10.59	38.96	16.07	17.86
Lane Group LOS	D	D	D	D	C	D	D	A	B	D	B	B
Critical Lane Group	yes	no	no	no	no	yes	yes	no	no	no	no	yes
50th-Percentile Queue Length [veh]	1.83	1.86	1.77	2.05	0.84	7.08	1.69	3.63	3.93	0.32	6.74	7.45
50th-Percentile Queue Length [ft]	45.75	46.44	44.25	51.20	21.05	177.04	42.20	90.64	98.21	8.05	168.62	186.22
95th-Percentile Queue Length [veh]	3.29	3.34	3.19	3.69	1.52	11.45	3.04	6.53	7.07	0.58	11.00	11.92
95th-Percentile Queue Length [ft]	82.35	83.59	79.65	92.16	37.89	286.15	75.95	163.15	176.79	14.49	275.10	298.12

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	40.40	36.48	36.84	48.19	34.42	44.87	35.47	10.16	10.59	38.96	16.64	17.86
Movement LOS	D	D	D	D	C	D	D	B	B	D	B	B
Critical Movement	no	no	no	yes	no	no	no	no	no	no	no	no
d_A, Approach Delay [s/veh]	37.82			43.48			13.24			17.09		
Approach LOS	D			D			B			B		
d_I, Intersection Delay [s/veh]	20.25											
Intersection LOS	C											
Intersection V/C	0.610											

Option 2: Mid-Day Improvements

Number	93											
Intersection	Pats Ranch Road / 68th Street											
Control Type	Signalized											
Analysis Method	HCM 2010											
Name				Pats Ranch Road			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Base Volume Input [veh/h]	33	54	9	163	93	399	341	493	57	15	599	183
Total Analysis Volume [veh/h]	49	80	13	240	93	588	503	727	57	15	883	270

Intersection Settings

Cycle Length [s]	75											
Coordination Type	Time of Day Pattern Coordinated											
Actuation Type	Fully actuated											
Lost time [s]	0.00											
Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	3	3	8	0	7	4	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	5	5	5	0	5	5	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	8	27	0	10	29	8	8	30	0	8	30	0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	no	no		no	no	no	no	no		no	no	
Maximum Recall	no	no		no	no	no	no	yes		no	yes	
Pedestrian Recall	no	no		no	no	no	no	no		no	no	

Lane Group Calculations

g / C, Green / Cycle	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00
(v / s)_i Volume / Saturation Flow Rate	0.03	0.06	0.98	0.06	0.41	1.06	0.24	0.24	0.03	0.28	0.19
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Arrival type	5		5			4			4		
s, saturation flow rate [veh/h]	1597	1636	244	1676	1425	473	1676	1634	519	3192	1425
c, Capacity [veh/h]	0	0	600	0	356	600	0	0	600	0	0
X, volume / capacity	0.00	0.00	0.40	0.00	1.65	0.84	0.00	0.00	0.03	0.00	0.00
d, Delay for Lane Group [s/veh]	0.00	0.00	7.99	0.00	308.54	19.17	0.00	0.00	6.02	0.00	0.00
Lane Group LOS	A	A	A	A	F	B	A	A	A	A	A
Critical Lane Group	no	no	no	no	yes	no	no	no	no	no	no
50th-Percentile Queue Length [veh]	0.00	0.00	1.13	0.00	30.19	3.99	0.00	0.00	0.00	0.00	0.00
50th-Percentile Queue Length [ft]	0.00	0.00	28.27	0.00	754.65	99.71	0.00	0.00	0.07	0.00	0.00
95th-Percentile Queue Length [veh]	0.00	0.00	2.04	0.00	48.59	7.18	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	50.89	0.00	1214.75	179.48	0.00	0.00	0.12	0.00	0.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	7.99	0.00	308.54	19.17	0.00	0.00	6.02	0.00	0.00
Movement LOS	A	A	A	A	A	F	B	A	A	A	A	A
Critical Movement	no	no	no	no	no	yes	no	no	no	no	no	no
d_A, Approach Delay [s/veh]	0.00			199.06			7.49			0.08		
Approach LOS	A			F			A			A		
d_I, Intersection Delay [s/veh]	54.88											
Intersection LOS	D											
Intersection V/C	0.250											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1914	379	0	2284	724	0	0	0	550	0	628
Number	5	2	12	1	6	16				7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0.0	186.3	186.3	0.0	186.3	188.1				186.3	186.3	186.3
Adj Flow Rate, veh/h	0	2015	399	0	2404	762				579	0	661
Adj No. of Lanes	0	3	1	0	3	1				2	0	2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	0	2	1				2	0	2
Cap, veh/h	0	3049	949	0	3049	959				977	0	867
Arrive On Green	0.00	0.60	0.60	0.00	1.00	1.00				0.28	0.00	0.28
Sat Flow, veh/h	0	5253	1583	0	5253	1599				3548	0	3149
Grp Volume(v), veh/h	0	2015	399	0	2404	762				579	0	661
Grp Sat Flow(s),veh/h/ln	0	1695	1583	0	1695	1599				1774	0	1575
Q Serve(g_s), s	0.0	19.9	10.2	0.0	0.0	0.0				10.7	0.0	14.6
Cycle Q Clear(g_c), s	0.0	19.9	10.2	0.0	0.0	0.0				10.7	0.0	14.6
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3049	949	0	3049	959				977	0	867
V/C Ratio(X)	0.00	0.66	0.42	0.00	0.79	0.79				0.59	0.00	0.76
Avail Cap(c_a), veh/h	0	3049	949	0	3049	959				1402	0	1245
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	0.25	0.25				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	10.1	8.1	0.0	0.0	0.0				23.8	0.0	25.2
Incr Delay (d2), s/veh	0.0	0.4	0.1	0.0	0.6	1.8				0.6	0.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.3	4.5	0.0	0.2	0.5				5.3	0.0	6.5
LnGrp Delay(d),s/veh	0.0	10.5	8.2	0.0	0.6	1.8				24.4	0.0	27.0
LnGrp LOS		B	A		A	A				C		C
Approach Vol, veh/h		2414			3166						1240	
Approach Delay, s/veh		10.1			0.9						25.8	
Approach LOS		B			A						C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		
Phs Duration (G+Y+Rc), s		50.0		25.9		50.0		
Change Period (Y+Rc), s		4.5		5.0		4.5		
Max Green Setting (Gmax), s		45.5		30.0		45.5		
Max Q Clear Time (g_c+I1), s		21.9		16.6		2.0		
Green Ext Time (p_c), s		22.3		4.3		39.6		

Intersection Summary	
HCM 2010 Ctrl Delay	8.7
HCM 2010 LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	2292	192	0	2526	464	537	1	1027	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	0.0	186.3	184.5	0.0	188.1	188.1	186.3	186.3	188.1			
Adj Flow Rate, veh/h	0	2388	200	0	2631	483	560	0	1070			
Adj No. of Lanes	0	3	1	0	3	1	2	0	2			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	0	2	3	0	1	1	2	0	1			
Cap, veh/h	0	2662	821	0	2689	835	1294	0	1166			
Arrive On Green	0.00	0.52	0.52	0.00	0.52	0.52	0.36	0.00	0.36			
Sat Flow, veh/h	0	5253	1568	0	5305	1594	3548	0	3198			
Grp Volume(v), veh/h	0	2388	200	0	2631	483	560	0	1070			
Grp Sat Flow(s),veh/h/ln	0	1695	1568	0	1712	1594	1774	0	1599			
Q Serve(g_s), s	0.0	35.9	5.9	0.0	42.5	17.6	10.1	0.0	27.2			
Cycle Q Clear(g_c), s	0.0	35.9	5.9	0.0	42.5	17.6	10.1	0.0	27.2			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2662	821	0	2689	835	1294	0	1166			
V/C Ratio(X)	0.00	0.90	0.24	0.00	0.98	0.58	0.43	0.00	0.92			
Avail Cap(c_a), veh/h	0	2662	821	0	2689	835	1294	0	1166			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	0.72	0.72	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	18.2	11.1	0.0	19.8	13.8	20.4	0.0	25.8			
Incr Delay (d2), s/veh	0.0	3.9	0.5	0.0	13.0	2.9	1.1	0.0	12.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	17.6	2.7	0.0	23.0	8.3	5.1	0.0	14.0			
LnGrp Delay(d),s/veh	0.0	22.1	11.6	0.0	32.8	16.8	21.4	0.0	38.5			
LnGrp LOS		C	B		C	B	C		D			
Approach Vol, veh/h		2588			3114			1630				
Approach Delay, s/veh		21.3			30.3			32.7				
Approach LOS		C			C			C				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		49.0				49.0		36.0
Change Period (Y+Rc), s		4.5				4.5		5.0
Max Green Setting (Gmax), s		44.5				44.5		31.0
Max Q Clear Time (g_c+I1), s		37.9				44.5		29.2
Green Ext Time (p_c), s		6.6				0.0		1.3

Intersection Summary	
HCM 2010 Ctrl Delay	27.6
HCM 2010 LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Option 3: PM Improv

Number	89											
Intersection	Pats Ranch Road / Limonite Avenue											
Control Type	Signalized											
Analysis Method	HCM 2010											
Name	Pats Ranch Road			Pats Ranch Road			Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Base Volume Input [veh/h]	589	100	427	50	100	163	110	2316	575	419	2197	21
Total Analysis Volume [veh/h]	676	107	402	53	107	174	118	2474	607	473	2347	22

Intersection Settings

Cycle Length [s]	120											
Coordination Type	Time of Day Pattern Coordinated											
Actuation Type	Semi-actuated											
Lost time [s]	0.00											
Control Type	Protecte	Permiss	Overlap	Protecte	Permiss	Overlap	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss
Signal Group	3	8	1	7	4	5	5	2	3	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	5	5	5	5	5	6	5	5	6	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	21	14	16	17	10	11	11	53	21	16	58	0
Walk [s]	0	0	0	0	0	0	0	11	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	13	0	0	0	0
l1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Minimum Recall	no	no	no	no	no	no	no	no	no	no	no	
Maximum Recall	no	no	no	no	no	no	no	yes	no	no	yes	
Pedestrian Recall	no	no	no	no	no	no	no	no	no	no	no	

Lane Group Calculations

g / C, Green / Cycle	0.15	0.17	0.30	0.04	0.06	0.15	0.07	0.58	0.76	0.11	0.62	0.62
(v / s)_i Volume / Saturation Flow Rate	0.22	0.06	0.28	0.03	0.06	0.12	0.07	0.54	0.43	0.15	0.51	0.02
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Arrival type	5			5			6			6		
s, saturation flow rate [veh/h]	3101	1676	1425	1597	1676	1425	1597	4567	1425	3101	4567	1425
c, Capacity [veh/h]	465	279	429	66	98	216	106	2658	1079	336	2848	889
X, volume / capacity	1.45	0.38	0.94	0.80	1.09	0.81	1.11	0.93	0.56	1.41	0.82	0.02
d, Delay for Lane Group [s/veh]	255.21	39.20	58.82	74.41	169.71	69.93	170.45	7.37	2.12	237.14	2.86	0.05
Lane Group LOS	F	D	E	E	F	E	F	A	A	F	A	A
Critical Lane Group	yes	no	no	no	no	yes	no	yes	no	yes	no	no
50th-Percentile Queue Length [veh]	19.72	2.49	12.15	1.85	5.88	5.81	6.40	1.81	0.64	13.14	0.75	0.01
50th-Percentile Queue Length [ft]	493.08	62.16	303.75	46.25	146.99	145.37	160.11	45.32	15.91	328.40	18.83	0.32
95th-Percentile Queue Length [veh]	31.25	4.48	17.87	3.33	10.12	9.77	10.90	3.26	1.15	21.46	1.36	0.02
95th-Percentile Queue Length [ft]	781.37	111.90	446.66	83.24	253.07	244.24	272.51	81.57	28.64	536.45	33.90	0.57

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	255.21	39.20	58.82	74.41	169.71	69.93	170.45	7.37	2.12	237.14	2.86	0.05
Movement LOS	F	D	E	E	F	E	F	A	A	F	A	A
Critical Movement	yes	no	no	no	no	no	no	no	no	no	no	no
d_A, Approach Delay [s/veh]	169.08			102.61			12.39			41.83		
Approach LOS	F			F			B			D		
d_I, Intersection Delay [s/veh]	52.00											
Intersection LOS	D											
Intersection V/C	0.997											

Option 2: PM Improvements

Number	93											
Intersection	Pats Ranch Road / 68th Street											
Control Type	Signalized											
Analysis Method	HCM 2010											
Name	Pats Ranch Road			Pats Ranch Road			68th Street			68th Street		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Base Volume Input [veh/h]	33	54	9	92	93	403	345	453	57	15	408	60
Total Analysis Volume [veh/h]	39	64	11	108	110	475	407	534	67	18	481	71

Intersection Settings

Cycle Length [s]	60											
Coordination Type	Time of Day Pattern Coordinated											
Actuation Type	Fully actuated											
Lost time [s]	0.00											
Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	3	3	8	0	7	4	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	5	5	5	0	5	5	0
Maximum Green [s]	0	0	0	0	0	0	0	0	0	0	0	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	8	27	0	10	29	8	8	30	0	8	30	0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	no	no		no	no	no	no	no		no	no	
Maximum Recall	no	no		no	no	no	no	yes		no	yes	
Pedestrian Recall	no	no		no	no	no	no	no		no	no	

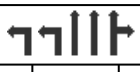
Lane Group Calculations

g / C, Green / Cycle	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00
(v / s)_i Volume / Saturation Flow Rate	0.02	0.05	0.25	0.07	0.33	0.59	0.18	0.18	0.03	0.15	0.05
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Arrival type	2		2			2			2		
s, saturation flow rate [veh/h]	1597	1634	435	1676	1425	690	1676	1612	617	3192	1425
c, Capacity [veh/h]	0	0	450	0	356	450	0	0	450	0	0
X, volume / capacity	0.00	0.00	0.24	0.00	1.33	0.90	0.00	0.00	0.04	0.00	0.00
d, Delay for Lane Group [s/veh]	0.00	0.00	9.26	0.00	174.71	32.22	0.00	0.00	8.04	0.00	0.00
Lane Group LOS	A	A	A	A	F	C	A	A	A	A	A
Critical Lane Group	no	no	no	no	yes	no	no	no	no	no	no
50th-Percentile Queue Length [veh]	0.00	0.00	0.35	0.00	16.75	3.90	0.00	0.00	0.02	0.00	0.00
50th-Percentile Queue Length [ft]	0.00	0.00	8.72	0.00	418.78	97.49	0.00	0.00	0.52	0.00	0.00
95th-Percentile Queue Length [veh]	0.00	0.00	0.63	0.00	26.95	7.02	0.00	0.00	0.04	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	15.70	0.00	673.71	175.48	0.00	0.00	0.94	0.00	0.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	9.26	0.00	174.71	32.22	0.00	0.00	8.04	0.00	0.00
Movement LOS	A	A	A	A	A	F	C	A	A	A	A	A
Critical Movement	no	no	no	no	no	yes	no	no	no	no	no	no
d_A, Approach Delay [s/veh]	0.00			121.19			13.01			0.25		
Approach LOS	A			F			B			A		
d_I, Intersection Delay [s/veh]	40.77											
Intersection LOS	D											
Intersection V/C	0.250											

Option 3: PM Improv

Number	94											
Intersection	Wineville Avenue / Limonite Avenue											
Control Type	Signalized											
Analysis Method	HCM 2010											
Name				Wineville Avenue			Limonite Avenue			Limonite Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Base Volume Input [veh/h]	121	56	43	149	112	421	365	2314	112	69	2094	126
Total Analysis Volume [veh/h]	131	61	47	161	121	456	395	2521	87	75	2295	137

Intersection Settings

Cycle Length [s]	100											
Coordination Type	Time of Day Pattern Coordinated											
Actuation Type	Fully actuated											
Lost time [s]	0.00											
Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	7	4	0	3	8	5	5	2	0	1	6	0
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	5	0	4	5	4	4	6	0	4	6	0
Maximum Green [s]	37	58	0	37	58	20	20	0	0	75	0	0
Amber [s]	3.0	4.3	0.0	3.0	4.3	3.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	0.5	1.0	0.0	0.5	1.0	0.5	0.5	1.0	0.0	0.5	1.0	0.0
Split [s]	12	32	0	19	39	15	15	41	0	8	34	0
Walk [s]	0	5	0	0	5	0	0	10	0	0	10	0
Pedestrian Clearance [s]	0	21	0	0	16	0	0	13	0	0	12	0
l1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	no	no		no	no	no	no	no		no	no	
Maximum Recall	no	no		no	no	no	no	yes		no	yes	
Pedestrian Recall	no	no		no	no	no	no	no		no	no	

Lane Group Calculations

g / C, Green / Cycle	0.09	0.11	0.11	0.11	0.14	0.30	0.11	0.56	0.56	0.04	0.48	0.48
(v / s)_i Volume / Saturation Flow Rate	0.07	0.03	0.03	0.09	0.03	0.29	0.11	0.48	0.49	0.02	0.45	0.46
so, Base Saturation Flow per Lane [veh/h/ln]	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Arrival type	3			3			3			3		
s, saturation flow rate [veh/h]	1774	1863	1607	1774	3547	1583	3445	3547	1831	3445	3547	1810
c, Capacity [veh/h]	152	210	181	194	484	482	396	1978	1021	130	1704	870
X, volume / capacity	0.86	0.27	0.29	0.83	0.25	0.95	1.00	0.86	0.88	0.58	0.94	0.95
d, Delay for Lane Group [s/veh]	72.53	40.90	41.08	49.82	38.77	63.66	56.48	24.26	29.95	48.89	36.25	46.17
Lane Group LOS	E	D	D	D	D	E	E	C	C	D	D	D
Critical Lane Group	yes	no	no	no	no	yes	yes	no	no	no	no	yes
50th-Percentile Queue Length [veh]	4.24	1.23	1.15	4.09	1.29	14.07	5.36	15.84	18.39	0.90	17.97	21.09
50th-Percentile Queue Length [ft]	106.05	30.70	28.87	102.13	32.19	351.71	134.08	396.05	459.65	22.48	449.21	527.20
95th-Percentile Queue Length [veh]	7.62	2.21	2.08	7.35	2.32	20.22	9.16	22.37	25.42	1.62	24.92	28.62
95th-Percentile Queue Length [ft]	190.49	55.26	51.97	183.83	57.93	505.49	229.03	559.23	635.45	40.46	623.00	715.48

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	72.53	40.92	41.08	49.82	38.77	63.66	56.48	26.09	29.95	48.89	39.25	46.17
Movement LOS	E	D	D	D	D	E	E	C	C	D	D	D
Critical Movement	yes	no	no	no	no	no	no	no	no	no	no	no
d_A, Approach Delay [s/veh]	58.28			56.56			30.20			39.91		
Approach LOS	E			E			C			D		
d_I, Intersection Delay [s/veh]	37.99											
Intersection LOS	D											
Intersection V/C	0.836											

APPENDIX 8.9:

HORIZON YEAR (2035) WITHOUT PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Intersection: 7: I-15 SB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	T	R	T	T	T	R	L	LT	R	R
Maximum Queue (ft)	216	209	181	166	119	89	75	267	129	161	193	164
Average Queue (ft)	129	104	85	72	53	31	22	158	26	92	102	42
95th Queue (ft)	190	176	155	130	96	73	56	248	80	151	165	131
Link Distance (ft)	1167	1167	1167		664	664	664	664		1072	1072	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				150					400			400
Storage Blk Time (%)			0	0								
Queuing Penalty (veh)			3	2								

Intersection: 8: I-15 NB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	T	T	T	R	T	T	T	R	L	LT	R	R
Maximum Queue (ft)	233	216	204	130	162	194	301	163	233	263	201	157
Average Queue (ft)	148	132	118	50	89	57	139	72	71	150	112	55
95th Queue (ft)	211	202	193	89	143	134	236	130	182	232	172	134
Link Distance (ft)	664	664	664	664	1117	1117	1117	1117		1245	1245	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)									450			450
Storage Blk Time (%)												
Queuing Penalty (veh)												

Network Summary

Network wide Queuing Penalty: 6

Intersection: 7: I-15 SB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	T	R	T	T	T	R	L	LT	R	R
Maximum Queue (ft)	268	235	218	84	202	198	215	172	226	255	259	238
Average Queue (ft)	184	150	101	33	111	102	123	87	80	141	168	129
95th Queue (ft)	252	225	186	64	183	171	187	146	179	213	246	226
Link Distance (ft)	1167	1167	1167		664	664	664	664		1072	1072	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				150					400			400
Storage Blk Time (%)			1	0								
Queuing Penalty (veh)			3	0								

Intersection: 8: I-15 NB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	T	T	T	R	T	T	T	R	L	LT	R	R
Maximum Queue (ft)	295	280	302	85	386	427	495	168	188	242	358	332
Average Queue (ft)	216	198	193	33	248	234	267	38	87	157	235	207
95th Queue (ft)	279	264	280	67	346	364	427	105	177	231	318	292
Link Distance (ft)	664	664	664	664	1117	1117	1117	1117		1245	1245	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)									450			450
Storage Blk Time (%)												
Queuing Penalty (veh)												

Network Summary

Network wide Queuing Penalty: 4

APPENDIX 8.10:

HORIZON YEAR (2035) WITH PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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Intersection: 7: I-15 SB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	T	R	T	T	T	R	L	LT	R	R
Maximum Queue (ft)	182	185	382	185	114	96	77	274	113	192	208	185
Average Queue (ft)	121	97	91	75	60	38	22	177	25	92	114	56
95th Queue (ft)	174	162	253	139	101	83	59	255	79	162	189	154
Link Distance (ft)	1167	1167	1167		664	664	664	664		1072	1072	
Upstream Blk Time (%)			0									
Queuing Penalty (veh)			0									
Storage Bay Dist (ft)				150					400			400
Storage Blk Time (%)			0	0								
Queuing Penalty (veh)			3	3								

Intersection: 8: I-15 NB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	T	T	T	R	T	T	T	R	L	LT	R	R
Maximum Queue (ft)	204	276	263	98	160	210	480	349	191	247	204	177
Average Queue (ft)	138	124	111	46	90	59	164	86	50	139	108	50
95th Queue (ft)	189	209	202	81	137	131	333	241	142	219	172	131
Link Distance (ft)	664	664	664	664	1117	1117	1117	1117		1245	1245	
Upstream Blk Time (%)							0	0				
Queuing Penalty (veh)							0	0				
Storage Bay Dist (ft)									450			450
Storage Blk Time (%)												
Queuing Penalty (veh)												

Network Summary

Network wide Queuing Penalty: 6

Intersection: 7: I-15 SB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB	SB
Directions Served	T	T	T	R	T	T	T	R	L	LT	R	R
Maximum Queue (ft)	263	247	202	97	188	178	192	222	213	256	268	253
Average Queue (ft)	187	157	101	37	113	101	124	104	99	157	167	126
95th Queue (ft)	250	232	182	70	174	160	181	173	203	243	247	225
Link Distance (ft)	1167	1167	1167		664	664	664	664		1072	1072	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)				150					400			400
Storage Blk Time (%)			1									
Queuing Penalty (veh)			4									

Intersection: 8: I-15 NB Ramps & Limonite Av.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	T	T	T	R	T	T	T	R	L	LT	R	R
Maximum Queue (ft)	318	292	294	73	365	418	644	292	206	468	379	356
Average Queue (ft)	224	207	192	31	252	251	306	44	95	168	259	229
95th Queue (ft)	287	270	276	60	341	372	509	194	197	332	343	324
Link Distance (ft)	664	664	664	664	1117	1117	1117	1117		1245	1245	
Upstream Blk Time (%)							0	0		0		
Queuing Penalty (veh)							0	0		0		
Storage Bay Dist (ft)									450			450
Storage Blk Time (%)												
Queuing Penalty (veh)												

Network Summary

Network wide Queuing Penalty: 4