LOS ANGELES
DEPARTMENT OF CITY
PLANNING
221 North Figueroa St., Suite 1350
Los Angeles, CA 90012

DRAFT
ENVIRONMENTAL IMPACT REPORT

4051 South Alameda Street Project
Partially Recirculated Draft EIR

Environmental Case No.: ENV-2012-920-EIR
State Clearinghouse No.: 2014061030

Project Location: 4051 South Alameda Street, Los Angeles, California, 90058

Community Plan Area: Southeast Los Angeles Community Plan Area

Council District: 9—Price

Project Description: Parcel Map No. AA-2012-919-PMLA and a Site Plan Review to permit the subdivision of one 562,314 net square-foot parcel into four lots (Lot 1: 3.23 net acres, Lot 2: 3.23 net acres, Lot 3: 3.23 net acres, and Lot 4: 3.23 net acres) in the M2-2 Zone. The project includes the construction of four industrial buildings consisting of Building 1: 115,973 square feet and up to 123 parking spaces; Building 2: 133,680 square feet and up to 79 parking spaces; Building 3: 116,724 square feet and up to 96 parking spaces; and Building 4: 113,743 square feet and up to 106 parking spaces.

Contents: This Partially Recirculated Draft EIR provides additional analysis of potential cumulative freeway traffic impacts.

PREPARED FOR:
The City of Los Angeles
Department of City Planning

PREPARED BY:
Meridian Consultants, LLC

APPLICANT:
Pima Alameda Partners, LLC

March 2019

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I. INTRODUCTION/SUMMARY

A. INTRODUCTION

This Partially Recirculated Draft EIR (PRDEIR) provides additional analysis of the potential for cumulative freeway impacts from the proposed 4051 South Alameda Street Project (proposed Project) and related projects. A description of the proposed Project is included in Section III, *Project Description*, of this PRDEIR.

As described in Sections 15121 and 15362 of the State California Environmental Quality Act (CEQA) Guidelines (California Code of Regulations, Section 15000 et seq.), an EIR is an informational document prepared to inform public agency decision makers and the public of the significant environmental effects of a project and identify feasible ways to minimize the significant effects.

This PRDEIR was prepared in accordance with Section 15151 of the State CEQA Guidelines, which defines the standards for EIR adequacy as follows: An EIR should be prepared with a sufficient degree of analysis to provide decision makers with information that enables them to make a decision that intelligently takes account of environmental consequences. An evaluation of the environmental effects of a project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection, but for adequacy, completeness, and a good-faith effort at full disclosure.

1. Environmental Review Process

As defined by Section 15050 of the CEQA Guidelines, the City of Los Angeles Planning Department is the Lead Agency for the proposed Project. A Notice of Preparation (NOP) was prepared and circulated on June 17, 2014, through July 17, 2014, for the required 30-day public review period to solicit input on the scope and content of the EIR.

The Draft EIR was completed and forwarded to the Governor's Office of Planning and Research (OPR), and a Notice of Completion was posted at both OPR and the Office of Los Angeles County Clerk on January 22, 2015. A Notice of Availability (NOA) of the Draft EIR for public review was advertised in the *Los Angeles Times* newspaper as well as sent via mail to 85 public

agency representatives and 265 interested parties, including private organizations and individuals. The Draft EIR was made available for public review at the City of Los Angeles website for a period of 46 days from January 22, 2015, through March 9, 2015. In addition, copies of the Draft EIR were available during the public review period at three local libraries: the Vernon Branch and Junipero Serra Branch Libraries, and the Los Angeles Central Library.

Although the 46-day public comment period closed on March 9, 2015, at 5 p.m., the City received and accepted the submittal of thirteen (13) late letters of comment from individuals and one (1) late letter of comment from a City agency. In total, the City received seven (7) letters of comment from agencies and eighty-one (81) letters of comment from individuals and organizations. The City completed the Final EIR, which included responses to these comments, in June 2016.

The City's Deputy Advisory Agency (Advisory Agency) and the Department of City Planning conducted a public hearing in July 2016 to consider the EIR and the Project. In September 2016, a Letter of Determination was issued certifying the Final EIR, approving Parcel Map No. AA-2012-919-PMLA to permit the subdivision of one 562,314 net-square-foot parcel into four lots and Site Plan Review to allow the development of more than 50,000 net square feet of nonresidential floor area. These actions were appealed; the City Planning Commission (CPC) held a public hearing in November 2016 and denied the appeal and upheld the decision to certify the EIR and approve the Project. This decision by the CPC was appealed to the City Council. In early March 2017, the City Planning and Land Use Management Committee (PLUM), a subcommittee of the City Council, conducted a public hearing on the proposed Project and recommended that the City Council deny the appeal, approve the proposed Project, and adopt the CPC's decision. On March 21, 2017, the City Council conducted a hearing on the proposed Project, denied the appeal, and adopted the CPC's decision.

A lawsuit challenging the City's actions was filed in April 2017, a hearing on the writ petition was conducted in August 2018, and a Peremptory Writ of Mandate (Writ) was issued on January 8, 2019 that required the City to revise the EIR to include additional cumulative freeway traffic impact analysis in the EIR. The Writ only required additional analysis of potential cumulative freeway impacts. The Writ stated the Project approvals were not found to be in non-compliance with CEQA. The approvals were based on portions of the EIR that have not been found to violate CEQA and, for this reason, no remedial action is required unless compliance with the Writ changes or affects such previous approvals. Accordingly, this PRDEIR presents the additional cumulative freeway traffic impact analysis required by the Writ.

This PRDEIR is being circulated for a 45-day review and comment period by the public and other interested parties, agencies, and organizations in accordance with Section 15087 of the CEQA Guidelines.

The PRDEIR was provided to the State Clearinghouse for distribution to responsible and trustee agencies. In addition, a public NOA of the PRDEIR was published in the *Los Angeles Times* and mailed directly to interested parties requesting the document (in either electronic or hard copy format). The dates of the public review period are Thursday, March 21, 2019, to Monday, May 6, 2019, a period of 46 days. The PRDEIR was also made available for public review on the Department of City Planning's website (http://planning.lacity.org/ [click on "Environmental Review" and then "Draft EIR"]). In addition, copies of the PRDEIR were made available during the public review period for review at three local libraries:

Vernon–Leon H. Washington Jr. Memorial Branch Library
4504 South Central Avenue
Los Angeles, CA 90011
(323) 234-9106
Hours: Mon., 10 a.m.–8 p.m.; Tues., 12:30 p.m.–8 p.m.; Wed., 10 a.m.–8 p.m.; Thurs., 12:30 p.m.–8 p.m.; Fri., 10 a.m.–5:30 p.m.; Sat., 10 a.m.–5:30 p.m.; Sun., Closed

Junipero Serra Branch Library
4607 South Main Street
Los Angeles, CA 90037
(323) 234-1685
Hours: Mon., 10 a.m.–8 p.m.; Tues., 12:30 p.m.–8 p.m.; Wed., 10 a.m.–8 p.m.; Thurs., 12:30 p.m.–8 p.m.; Fri., 10 a.m.–5:30 p.m.; Sat: 10 a.m.–5:30 p.m.; Sun: Closed

Los Angeles Central Library
630 West 5th Street
Los Angeles, CA 90071
(213) 228-7000
Hours: Mon., 10 a.m.–8 p.m.; Tues., 10 a.m.–8 p.m.; Wed., 10 a.m.–8 p.m.; Thurs., 10 a.m.–8 p.m.; Fri., 10 a.m.–5:30 p.m.; Sat., 10 a.m.–5:30 p.m.; Sun: 1 p.m.–5 p.m.

All comments or questions on the PRDEIR should be directed to the City Planning Department:

William Lamborn
Major Projects and Environmental Analysis Section
Department of City Planning
City of Los Angeles
221 North Figueroa St., Suite 1350
Los Angeles, CA 90012
william.lamborn@lacity.org

The City will consider comments received on the additional cumulative freeway traffic impact analysis. Following the public review of the PRDEIR, the City will evaluate and respond to comments as provided in Section 15088. A Partially Recirculated Final EIR will be prepared with responses to comments received during the public review period on the cumulative freeway traffic impact analysis.

2. Organization of the PRDEIR

This PRDEIR is organized into six sections:

- **Section I: Introduction/Summary:** This section presents an introduction to the supplemental analysis of cumulative freeway impacts provided in this PRDEIR and a summary of the project description and cumulative freeway traffic impact analysis.
- **Section II: Environmental Setting:** This section presents an overview of the environmental setting of the proposed Project, including existing and surrounding land uses and identification of the related projects considered in the cumulative freeway traffic impact analysis.
- **Section III: Project Description:** This section presents a description of the proposed Project, including location, site characteristics, and Project objectives.
- **Section IV: Environmental Impact Analysis:** This section presents the results of the cumulative freeway traffic impact analysis and other cumulative impacts.

This document incorporates by reference the January 2015 Draft EIR and June 2016 Final EIR prepared for the proposed Project. The additional Cumulative Freeway Analysis presented in this document, together with the January 2015 Draft EIR and June 2016 Final EIR, constitutes the Revised EIR for the proposed Project.

B. SUMMARY

The purpose of the Summary is to provide the reader with a clear and simple description of the proposed Project and the potential for the proposed Project to contribute to cumulative impacts on freeway facilities.

1. Summary of the Project

The proposed Project includes the construction of a new industrial park consisting of four buildings. Building 1 consists of a single story with a mezzanine that occupies approximately 115,973 total square feet and up to 123 parking spaces; Building 2 consists of up to 2 stories that occupy up to approximately 133,680 total square feet and up to 79 parking spaces; Building 3 consists of a single story with a mezzanine that occupies up to approximately 116,724 total square feet and up to 96 parking spaces; and Building 4 consists of a single story with a mezzanine that occupies up to approximately 113,743 total square feet and up to 106 parking spaces. In total, the proposed Project would occupy include 466,120 square feet of warehouse and ancillary office space and 14,000 square feet of manufacturing space. The heights of each of the four buildings range from 37 feet to a maximum building height of 40 feet. Consistent with the policies of the urban design chapter of the Southeast Los Angeles Community Plan, the proposed Project design includes the installation of shielded exterior area lighting wall packs mounted to the faces of the buildings 29 feet above the finished floor to provide nighttime light shielding for the nearest residence, a duplex located approximately 150 feet west of the proposed Project site at 4015 and 4017 Long Beach Avenue. Surface parking would be located adjacent to the front and side facades of the four proposed buildings. The proposed Project has been designed with the rear of Buildings 1 and 2 and the rear of Buildings 3 and 4 facing one another; the remaining three faces of each building have been designed with pedestrian-scale features, such as decorative concrete panels in different shades of beige with gray trim and glazing, to break up the building facades; mechanical roof equipment completely screened from view; enclosure of trash areas; and operable windows on the mezzanine level. A landscape buffer would separate the public sidewalks from the parking lots, and the following street dedications would be made to the City:

- 5-foot street widening on Martin Luther King Jr. Boulevard
- 8.5-foot street widening on the north and 12.5-foot street widening on South Alameda Street
- 22-foot street widening on 41st Street

Pedestrian/vehicular conflicts would be minimized through a perimeter sidewalk with clearly defined driveways located at breaks in a continuous landscape strip.

The City of Los Angeles Zoning Ordinance designates the proposed Project area as M2-2, Light Industrial Zone.[1] The purpose of the M2 zoning classification is to allow for lower-impact industrial uses, such as clothing design and manufacturing; furniture design and manufacturing; packaging and assembly; warehouse and distribution; biomedical research and manufacturing; and wholesale sales. Light industry also includes a variety of "neighborhood industrial services" that benefit from the close geographic relationship to customers, wholesalers, and related services. Such uses include animal hospitals and kennels; automobile service and painting; and lumber yards and specialty construction materials.

2. Cumulative Freeway Analysis

The Cumulative Freeway Analysis considers the potential cumulative impacts from the proposed Project and related projects on the freeway system. In accordance with Caltrans' policy to conduct long-term planning for the state highway facilities and consistent with the Southern California Association of Governments' (SCAG) *2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS): Towards a Sustainable Future* (Southern California Association of Governments, April 2012),[2] the Cumulative Freeway Analysis includes projections of Year 2035 conditions without and with Project traffic.

The Cumulative Freeway Analysis isolates the potential impact of Project traffic on Year 2035 cumulative conditions along Interstate 10 (I-10) at Alameda Street, assuming background traffic growth occurs at an annual rate of 1 percent and considering the traffic generated by the related projects considered in the analysis.

The analyses conducted of freeway facilities included four mainline segments of the I-10 freeway (eastbound and westbound segments both east and west of Alameda Street), the two signalized I-10/Alameda Street ramp intersections, and two off-ramp locations.

1 City of Los Angeles Municipal Code, ch. 1, art. 2, sec. 12.19.
2 Southern California Association of Governments, *The 2012–2035 Regional Transportation Plan/Sustainable Communities Strategy: Towards a Sustainable Future (April 2012),* accessed February 2019, http://rtpscs.scag.ca.gov/Documents/2012/final/f2012RTPSCS.pdf.

- The four freeway mainline segments on I-10 were analyzed using the *Highway Capacity Manual,* 6th edition (HCM),[3] methodology to determine density, speed, and level of service (LOS), consistent with Caltrans District 7 requirements.

- The two intersections located at freeway ramps and under partial Caltrans jurisdiction were analyzed using HCM methodology to identify vehicle delay and LOS.

- The two freeway off-ramps were analyzed for ramp queue lengths using the Vistro software to estimate queues.

Caltrans guidelines do not require the analysis of queues or capacity of freeway on-ramps because the performance of on-ramps is measured by the on-ramp/street intersection capacity calculations and the ramp meters on the ramp itself.

a) Cumulative Freeway Mainline Segment Analysis—2035

The mainline freeway segment analysis shows that in Year 2035, Project traffic to be added to these freeway segments totals between 6 and 22 Project vehicles per hour compared to the respective Year 2035 traffic levels of between 8,900 and 14,500 vehicles per direction per hour. The change in operating density on the four measured segments is a maximum change of 0.1 vehicles per mile per lane. No change in operating speed will result from adding Project traffic to the four freeway segments. These incremental change in the freeway operating conditions are very small and are not significant.

While the Project would contribute to future Year 2035 cumulative traffic growth on the freeway system, Project traffic would represent 0.2–1.20 percent of the projected growth in traffic volumes, with both traffic from related projects and ambient traffic growth assumed at 1 percent per year on the freeway segments analyzed between (between 2014 and 2035). Project traffic would average 0.66 percent of the new traffic growth on the four freeway segments during the peak periods of the day. Project traffic growth at its highest segment would represent the addition of one car every 15 minutes per lane of freeway, a very small incremental increase not considered significant.

b) Cumulative Intersection Analysis—Year 2035

The intersection analysis evaluates the two freeway ramp locations on the I-10/Alameda Street interchange. Caltrans does not have specific criteria to determine the significance of incremental

3 National Research Council, Transportation Research Board, *Highway Capacity Manual: A Guide for Multimodal Mobility Analysis,* 6th ed. (Washington, DC: Transportation Research Board, 2016).

changes in intersection operations. For this reason, the Los Angeles Department of Transportation threshold of significance was used to evaluate these intersections. This threshold identifies an increase in intersection delay of 6.0 seconds at LOS C and 4.0 seconds at LOS D as significant.[4]

The 2035 traffic volumes were developed by increasing the existing traffic volumes with both traffic from related projects and ambient traffic growth assumed at 1 percent per year. The ramp intersections are projected to operate at LOS D or better under all scenarios, regardless of the addition of Project traffic. With an operation of LOS C or D, the incremental increases in delay resulting from the addition of Project traffic would be in the 0.7- to 3.1-second range—below the threshold for significance. Therefore, the addition of Project traffic will not contribute to a significant cumulative impact at these intersections.

c) Cumulative Off-Ramp Queue Analysis—Year 2035

The queues at the two off-ramps will not extend beyond the available capacity under Future Scenario (Year 2035), without and with the addition of Project traffic. The queue lengths were estimated using Vistro, which reports the 95th percentile queue length, in feet, for each approach lane on the off-ramp. The addition of Project traffic does not substantially increase the off-ramp queue under any of the scenarios tested above (less than one vehicle length during any of the scenarios tested). Therefore, the addition of Project traffic will not contribute to a significant cumulative impact at either ramp location.

3. Cumulative Analysis – Other Topics

The January 2015 Draft EIR provided cumulative impact analyses for each environmental topic in Section IV: *Environmental Impact Analysis.* These analyses considered the related projects in assessing the potential for the Project to contribute to cumulative impacts in 2016, the projected opening year for the Project. By contrast, the additional Cumulative Freeway Analysis considers the potential for the related projects and projected growth in ambient traffic to provide cumulative impact analysis for Year 2035 which, as discussed above, is the long-range planning horizon defined by Caltrans, the state agency responsible for the planning, maintenance, and operation of the freeway system. The additional analysis of Year 2035 freeway conditions in response to the long-range freeway planning horizon defined by Caltrans does not affect the methodology, approach, or conclusions for analysis of potential cumulative impacts in 2016 for

4 Los Angeles Department of Transportation, *Traffic Study Policies and Procedures* (August 2014), 16.

the other topics addressed in the EIR, including air quality, cultural resources, greenhouse gas emissions, hazards and hazardous materials, land use and planning, local street network, and utilities and service systems, This is because Caltrans' policy to conduct long-term planning for state highway facilities consistent with the SCAG RTP/SCS planning horizon is not applicable to other topics for this reason. In addition, as discussed above, the Writ required additional analysis of cumulative freeway traffic impacts. All other portions of the EIR were determined to comply with CEQA. No additional or updated analysis of cumulative impacts for these other topics is, therefore, required by the Writ or the freeway cumulative impact analysis.

II. ENVIRONMENTAL SETTING

A. OVERVIEW OF ENVIRONMENTAL SETTING

This section provides a brief overview of the regional and local setting of the proposed project. A list of related projects is also provided.

1. Regional Setting

The proposed Project would be located in the City of Los Angeles (City), bordered by the City of Vernon to the east, and located approximately 6.5 miles north of the City of Compton, in Los Angeles County (**Figure II.A-1: Regional Vicinity Map**). The site is approximately 1 mile to the south of Interstate 10 and approximately 2.2 miles to the east of State Highway 110. The proposed Project site is located on the US Geological Survey (USGS) 7.5-minute series Los Angeles, California, topographic quadrangle (**Figure II.A-2: Topographic Map**). The elevation of the proposed Project site is approximately 200 feet above mean sea level (MSL) with up to a 4-foot transition to surrounding property elevations. The proposed Project site is bounded by East Martin Luther King Jr. Boulevard to the north, South Alameda Street to the east; East 41st Street to the south, and Long Beach Avenue to the west (**Figure II.A-3: Project Location**). The proposed Project is located within the Southeast Los Angeles Community Plan area (**Figure II.A-4: Southeast Los Angeles Community Plan Area**).

2. Local Setting

The proposed Project site at 4051 South Alameda Street is an approximately 13-acre vacant lot with scattered weeds and grasses. The site is rectangular in shape; a paved road (East 40th Place) transects the central portion in an east–west direction. Site drainage is controlled by sheet flow, via surface infiltration, and through City-maintained storm sewers located along nearby streets. Regional drainage is provided by the Los Angeles River, which is located approximately 1 mile east of the proposed Project site.

The area surrounding the proposed Project site is developed almost exclusively with light and heavy industrial uses with limited small-lot, single-family residential homes intermixed with light/industrial warehouse uses to the south and residential areas farther to the west. The Alameda Corridor rail line is located directly to the east and runs below grade in the Project area (**see Figure II.A-3**). The Alameda Corridor also includes the Southern Pacific Railroad right-of-

way across South Alameda Street. Directly to the west is the Metro commuter light rail line, which separates the industrial zone of the Project area with small-lot, single-family homes interspersed with various commercial and light industrial uses west of Long Beach Avenue. Other uses in the Project area include churches, schools, and a park. The largely industrial character of the surrounding area is a source of frequent truck and heavy-duty transport activity.

3. General Plan Designation

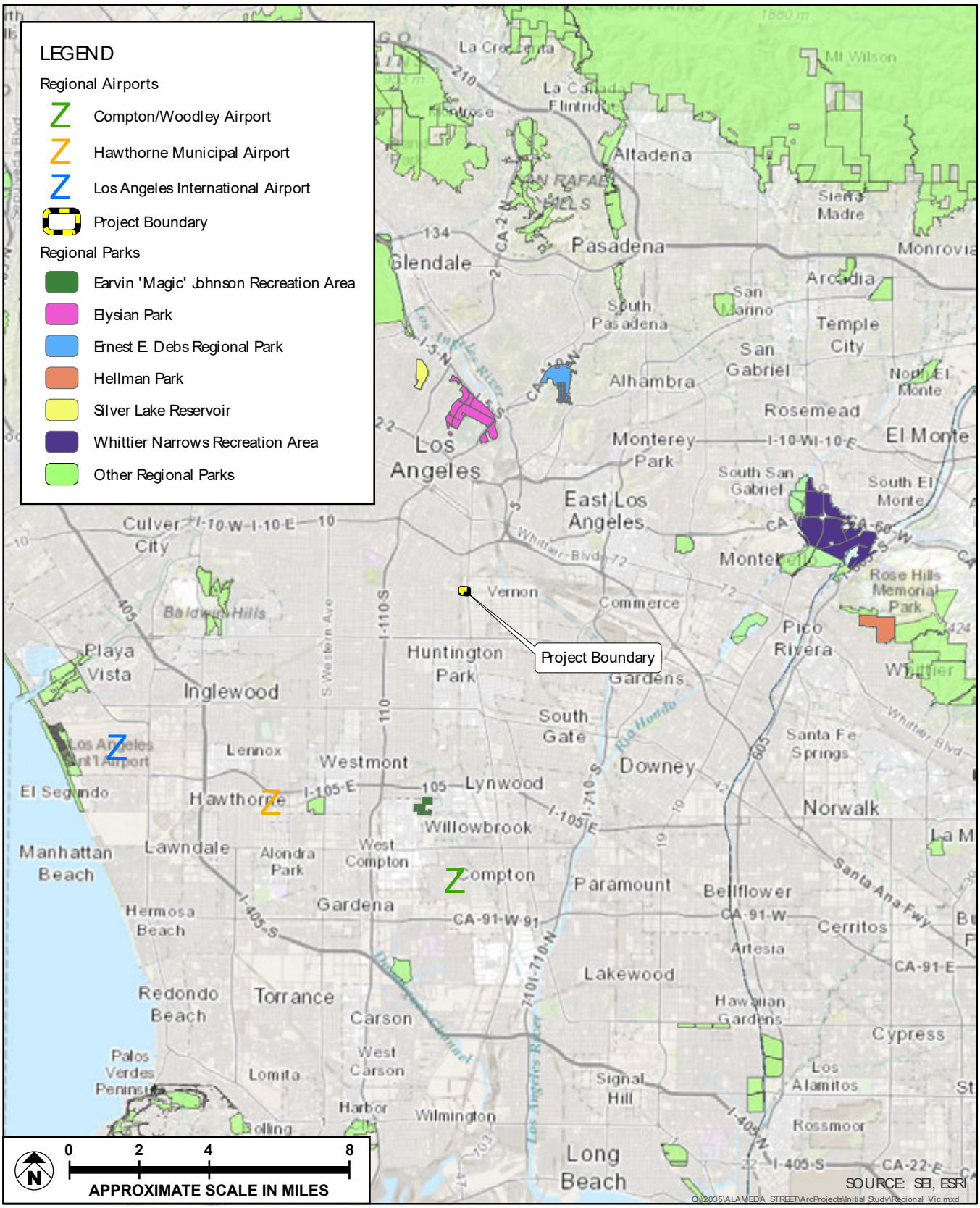
The proposed project is located in the Southeast Los Angeles Community Plan area of the City's General Plan, which designates the proposed Project site as Limited Industrial.[1] The land use designation prohibits nonindustrial uses and uses that compromise job-producing potential in the majority of industrial districts. In a few select areas, the Southeast Los Angeles Community Plan designates industrial land as Hybrid Industrial to accommodate mixed-use development with a limited amount of residential and compatible light industrial uses. The property immediately north of the proposed Project site is designated Heavy Industrial and property to the south is designated Limited Industrial. The property east of the site and Alameda Street is designated Limited Industrial.[2] The property to the immediate east is located within the City of Vernon and is designated as Industrial.[3]

4. Zoning

The proposed Project site consists of the following Assessor's Parcel Numbers:

5117-019-016	5117-020-032	5117-020-039
5117-019-017	5117-020-033	5117-020-040
5117-019-018	5117-020-034	5117-021-020
5117-019-019	5117-020-035	5117-021-021
5117-019-020	5117-020-036	5117-021-022
5117-020-029	5117-020-037	5117-021-023
5117-020-031	5117-020-038	

1 City of Los Angeles Department of City Planning (DCP) *Southeast Los Angeles Community Plan* (November 2017), accessed February 2019, https://planning.lacity.org/complan/pdf/selcptxt.pdf.
2 City of Los Angeles DCP, *Southeast Los Angeles Community Plan.*
3 City of Vernon Planning Division, *Vernon General Plan,* "Land Use Element" (adopted December 2007).



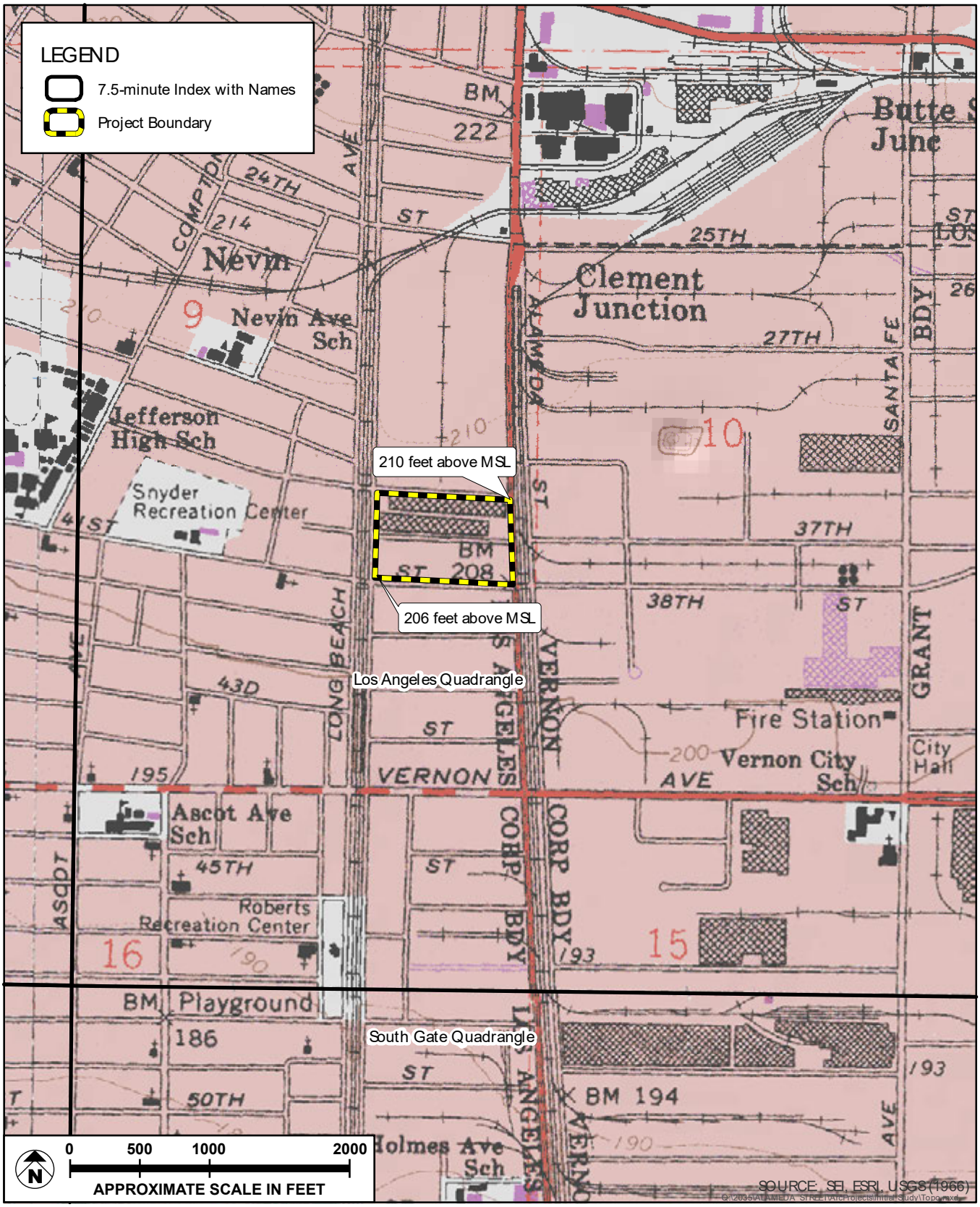
SOURCE: Meridian Consultants, LLC – January 2019

FIGURE **II.A-1**

Meridian Consultants

Regional Vicinity Map

058-006-18



SOURCE: Meridian Consultants, LLC – January 2019

FIGURE **II.A-2**

Meridian Consultants

Topographic Map

058-006-18

SOURCE: Meridian Consultants, LLC – January 2019

FIGURE **II.A-3**

Meridian Consultants

Project Location

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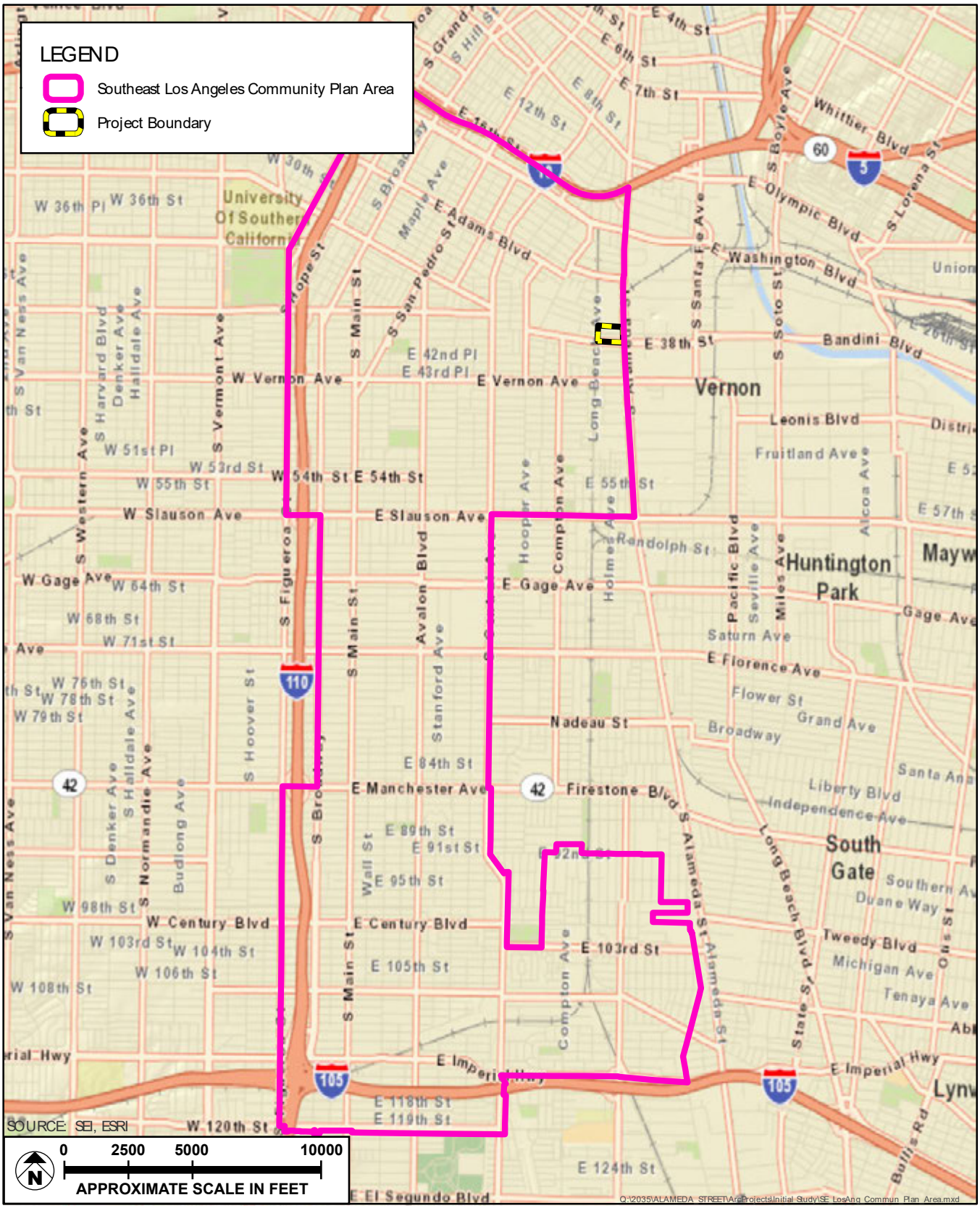


SOURCE: Meridian Consultants, LLC – January 2019

FIGURE **II.A-4**

Meridian Consultants

Southeast Los Angeles Community Plan Area

058-006-18

The City of Los Angeles Zoning Ordinance designates the proposed Project area as M2-2, Light Industrial Zone (**Figure II.A-5: Zoning Map**).[4] The purpose of the M2 zoning classification is to allow lower-impact industrial uses, such as clothing design and manufacturing; furniture design and manufacturing; packaging and assembly; warehouse and distribution; biomedical research and manufacturing; and wholesale sales. Light industry also includes a variety of "neighborhood industrial services" that benefit from the close geographic relationship to customers, wholesalers, and related services. Such uses include animal hospitals and kennels; automobile service and painting; and lumber yards and specialty construction materials.[5]

The additional zoning designations surrounding the proposed Project site within the City include M3, Heavy Industrial Zone, to the north; M1, Limited Industrial Zone, to the west; and M2 to the south.[6,7] The purpose of the industrial zoning (M1, M2, M3) classifications is to allow various industrial land uses—ranging from the heaviest of uses, such as large-scale manufacturing operations, refineries, and scrap metal facilities, to lighter industrial uses, such as furniture manufacturing, packaging and assembly, and warehouse/distribution. As mentioned above, the surrounding property to the east of the proposed Project site is located in the City of Vernon and is designated as I, General Industry Zone. The City of Vernon Zoning Ordinance for the General Industrial Zone allows industrial uses, data centers, cold-storage warehouses, industrial gas manufacturing, warehouse uses (other than cold-storage warehouses), and ancillary uses.[8]

B. RELATED PROJECTS

Section 15130 of the California Environmental Quality Act (CEQA) Guidelines requires that an Environmental Impact Report (EIR) consider the significant environmental effects of a project as well as cumulative impacts. A cumulative impact is defined as an impact that is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts (CEQA Guidelines Section 15355). As stated in CEQA Guidelines Section 15130(a)[1], the cumulative impacts discussion in an EIR need not discuss impacts that do not result in part from the project evaluated in the EIR. Section 15125 (a)(1) of the CEQA

4 City of Los Angeles Municipal Code (LAMC), ch. 1, art. 2, sec. 12.19.

5 City of Los Angeles DCP and the Community Redevelopment Agency of the City of Los Angeles, *Los Angeles' Industrial Land: Sustaining a Dynamic City Economy* (December 2007), accessed February 2019, https://planning.lacity.org/code_studies/landuseproj/Industrial_Files/Attachment%20B.pdf.

6 LAMC, ch. 1, art. 2, sec. 12.20.

7 LAMC, ch. 1, art. 2, sec. 12.17.6.

8 Comprehensive Zoning Ordinance of the City of Vernon, art. 4, sec. 26.4.1 (adopted January 16, 2008; last amended October 3, 2017).

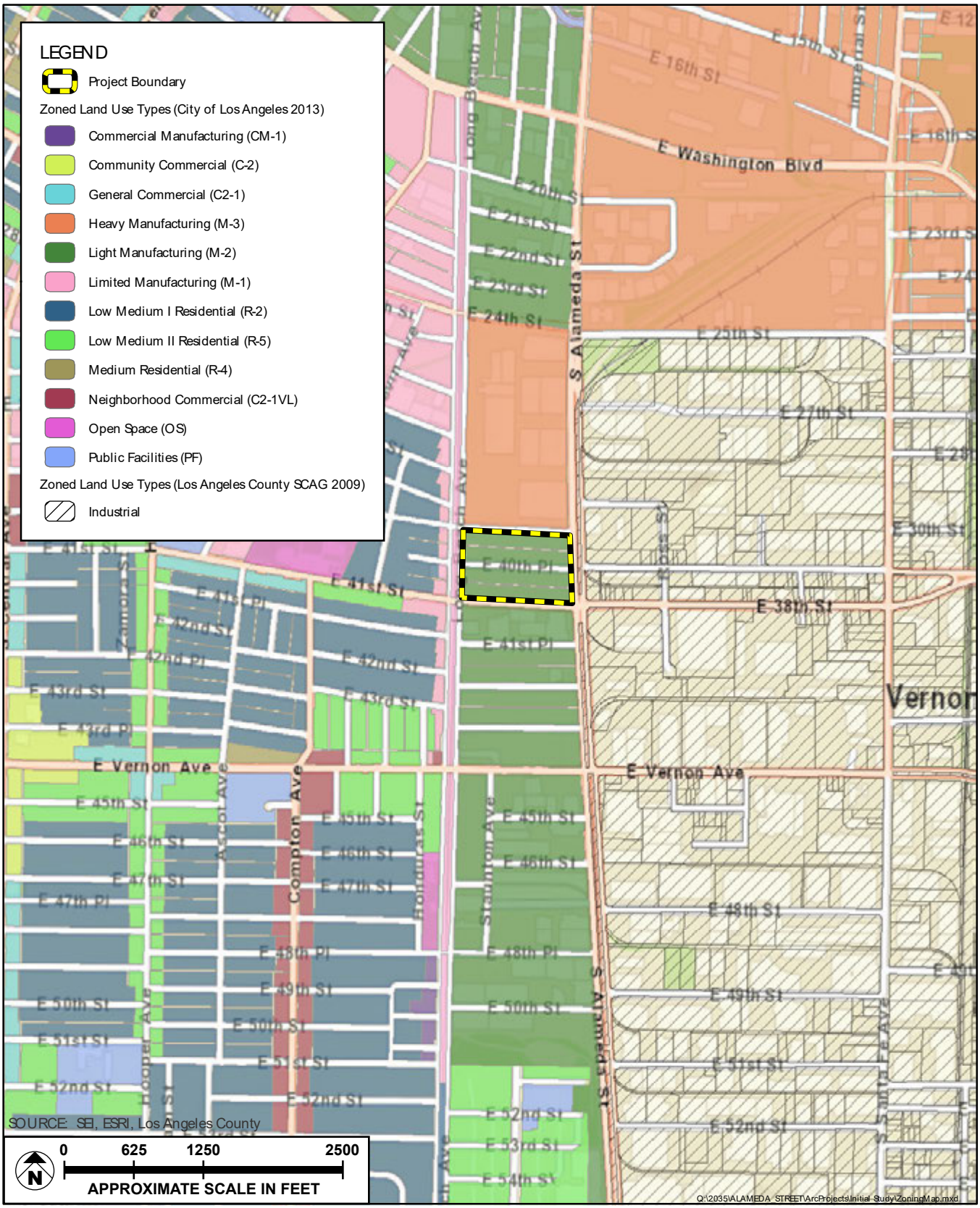
Guidelines[9] states that, generally, a lead agency should describe and consider physical environmental conditions as they exist at the time the notice of preparation of an EIR is published.

Table II.B-1: Related Projects, provides information on the 11 related projects identified by the City in June 2014, the date of the release of the Notice of Preparation of the Draft EIR, that are located within a 2-mile radius of the proposed Project (also see **Figure II.B-1: Related Projects**). The list in **Table II.B-1** includes past, current, and future projects identified by the City for consideration in the cumulative impact analysis in the EIR, consistent with the guidance provided in the Department of City Planning's *L.A. CEQA Thresholds Guide*[10] and Department of Transportation's *Traffic Study Policies and Procedures.*[11]

9 California Natural Resources Agency, *Amendments to the State CEQA Guidelines* (December 2018).

10 City of Los Angeles, DCP, *L.A. CEQA Thresholds Guide: Your Resource for Preparing CEQA Analyses in Los Angeles* (2006).

11 City of Los Angeles Department of Transportation, *Traffic Study Policies and Procedures* (August 2014).



SOURCE: Meridian Consultants, LLC – January 2019

FIGURE **II.A-5**

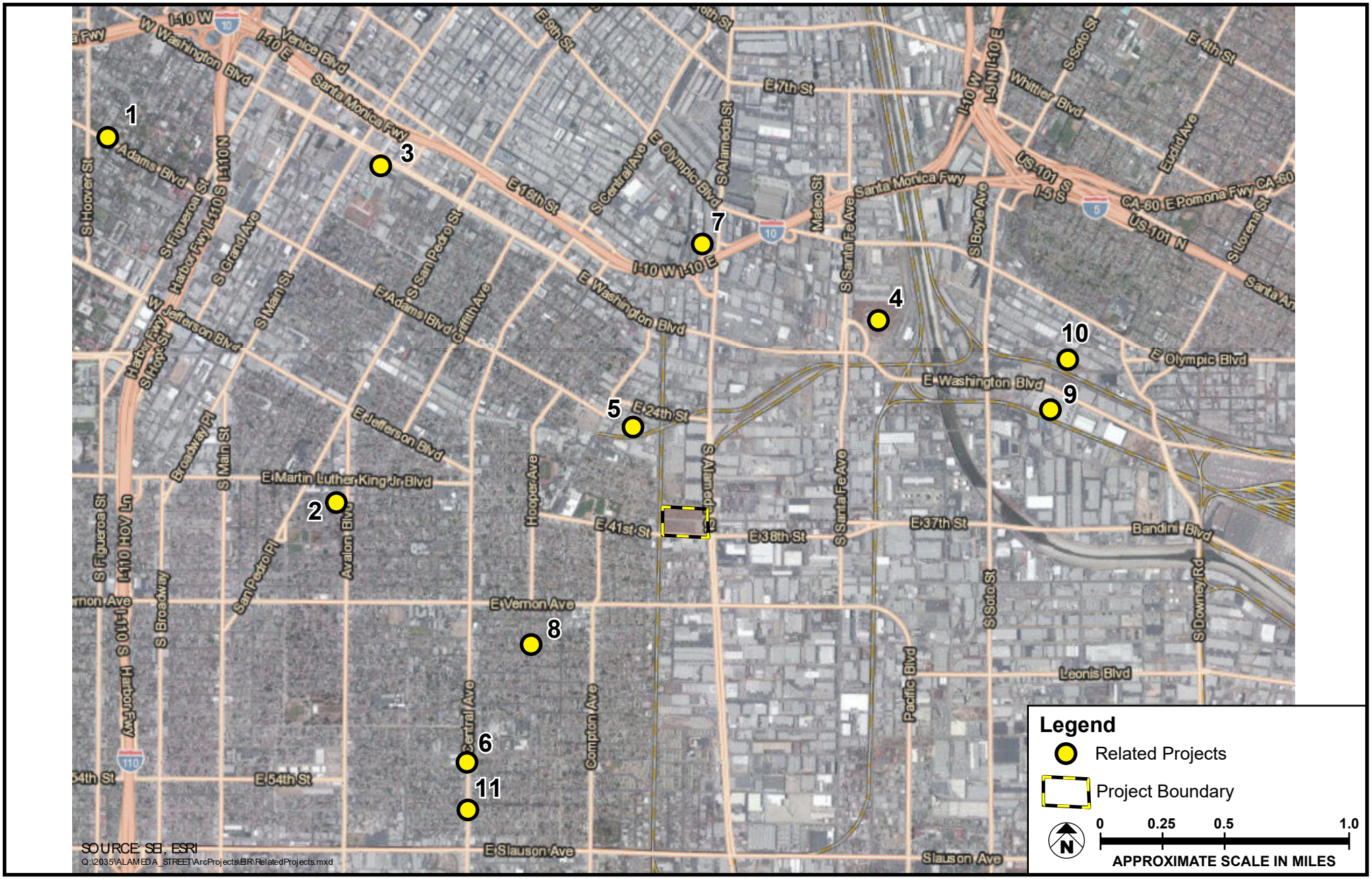
Meridian Consultants

Zoning Map

058-006-18

Table II.B-1
Related Projects

Map No.	File/Project No.	Location	Land Use	Distance from Proposed
1	ENV-2006-1071-MND	937 E Adams Blvd. Los Angeles, CA 90011	80 apartment units and ground floor retail	1
2	ENV-2007-1966-MND	4051 S Avalon Blvd. Los Angeles, CA 90011	23,787 sf mini-Shopping center	1.3
3	ENV-2013-3392-CE	220 E Washington Blvd. Los Angeles, CA 90015	78 apartment units and 5,600 sf retail	1.8
4	ENV-2013-174-EIR	2455 E Washington Blvd. Los Angeles, CA 90021	446,230 sf warehouse, office, light industrial	0.7
5	ENV-2013-339-MND	1571 E Adams Blvd. Los Angeles, CA 90011	5,224 sf warehousing and auto transmission and engine sales	0.3
6	ENV-2010-3288-MND	5300 S Central Avenue Los Angeles, CA 90011	6,942 sf conversion of church to coin laundry	1.2
7	ENV-2009-741-EAF	1742 E 14th Street Los Angeles, CA 90021	6,712 sf collection recycling center	1
8	ENV-2009-521-MND	1308 E 46th Street Los Angeles, CA 90011	3,484 sf church expansion and remodel	0.7
9	ENV-2008-2283-MND	2900 E Lugo Street Los Angeles, CA 90023	8 condominium units	1.4
10	ENV-2008-4579-MND	3110 E 12th Street Los Angeles, CA 90023	39,400 sf retail	1.5
11	ENV-2008-4428-MND	5600 S Central Avenue Los Angeles, CA 90011	Unmanned wireless telecommunications facility	1.4



SOURCE: Meridian Consultants LLC - 2017

FIGURE **II.B-1**

Meridian Consultants

Related Projects

058-006-18

III. PROJECT DESCRIPTION

A. PROJECT APPLICANT

The applicant for the proposed Project is:

Pima Alameda Partners, LLC
3435 Wilshire Blvd., Suite 1190
Los Angeles, California 90010

B. PROJECT CHARACTERISTICS

The proposed Project includes the construction of a new industrial park consisting of four buildings. Building 1 consists of a single story with a mezzanine that occupies approximately 115,973 total square feet with up to 123 parking spaces; Building 2 consists of two stories that occupy approximately 133,680 total square feet with up to 79 parking spaces; Building 3 consists of a single story with a mezzanine that occupies approximately 116,724 total square feet with up to 96 parking spaces; and Building 4 consists of a single story with a mezzanine that occupies approximately 113,743 total square feet with up to 106 parking spaces (**Figure III.B-1: Conceptual Site Plan**). In total, the proposed Project would occupy include 466,120 square feet of warehouse and ancillary office space and 14,000 square feet of manufacturing space. The heights of each of the four buildings range from 37 feet to a maximum building height of 40 feet (**Figure III.B-2: Building 1 Elevation**). Renderings of the proposed Project are shown in **Figures III.B-3: Project Rendering—Aerial** and **III.B-4: Project Rendering—Perspective**.

The proposed Project has been designed consistent with the policies of the urban design chapter of the Southeast Los Angeles Community Plan to provide safe and efficient space that has an appealing façade from adjacent public streets. The proposed Project would include exterior concrete flatwork, pavement, and various utilities, and would consist of reinforced concrete tilt-up structural elements supported on conventional shallow spread footings. The proposed Project design includes the installation of shielded exterior area lighting wall packs mounted to the faces of the buildings 29 feet above the finished floor to provide nighttime light shielding for the nearest residence, a duplex located approximately 150 feet west of the proposed Project site at 4015 and 4017 Long Beach Avenue. Surface parking would be located adjacent to the front and side facades of the four proposed buildings. The proposed Project has been designed with the rear of Buildings 1 and 2 and the rear of Buildings 3 and 4 facing one another. The remaining three faces of each building have been designed with

pedestrian-scale features, such as decorative concrete panels in different shades of beige with gray trim and glazing to break up the building facades; mechanical roof equipment completely screened from view; enclosure of trash areas; and operable windows on the mezzanine level. A landscape buffer would separate the public sidewalks from the parking lots, and the following street dedications would be made to the city:

- 5-foot street widening on Martin Luther King Jr. Boulevard
- 8.5-foot street widening on the north and 12.5-foot street widening on South Alameda Street
- 22-foot street widening on 41st Street

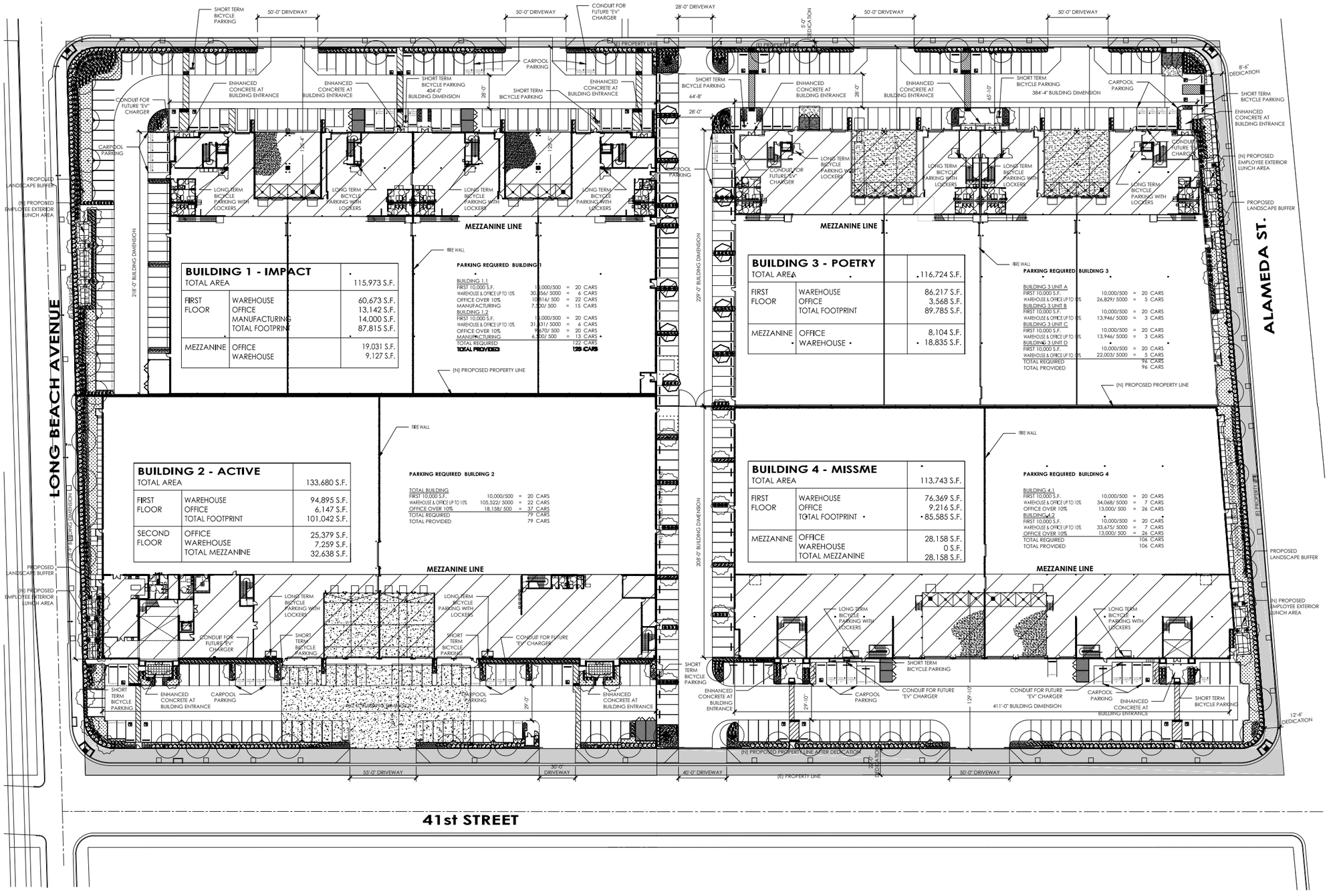
Pedestrian/vehicular conflicts would be minimized through a perimeter sidewalk with clearly defined driveways located at breaks in a continuous landscape strip. Other characteristics of the proposed Project, including safety and security improvements, site-specific geotechnical recommendations, a local hire agreement, and the anticipated construction schedule and process are described on pages III-2 to III-5 of the January 2015 Draft EIR.[1]

C. PROJECT OBJECTIVES

The underlying goal of the proposed Project is to enhance the industrial sector of the Southeast Los Angeles Community Plan area by providing nearly 1,000 jobs to the local economy. The following is a list of identified and prioritized objectives that are important to achieving the proposed Project goals:

- Construct a new industrial park that provides a minimum of 480,000 square feet of light industrial space to facilitate garment manufacturing.
- Locate a new industrial park within 3 miles of an existing garment manufacturing labor force in the Southeast Los Angeles Community Plan area.
- Develop an industrial park along the Alameda Corridor to take advantage of distribution-efficiency opportunities.
- Provide opportunities for the proposed Project's labor force to utilize existing public transit systems and other multimodal transportation opportunities near the proposed Project.
- Preserve and/or redevelop the industrial sector of the Southeast Los Angeles Community Plan area to accommodate emerging technologies, thus providing an enhanced employment base for the Community Plan area's population.
- The Southeast Los Angeles Community Plan area population stands to benefit from the proposed Project due to economic stimulation through employment opportunities; attraction of commercial and industrial tenants to the area; and provision of tax revenue for the City.

1 City of Los Angeles Department of City Planning, *Draft Environmental Impact Report, 4051 South Alameda Street Project* (January 2015).



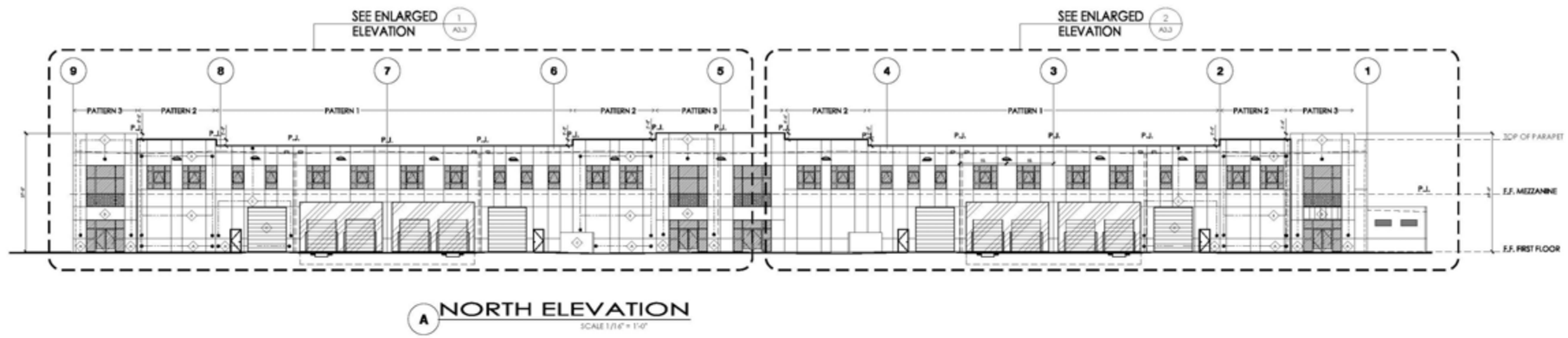
SOURCE: O. C. Design & Engineering - 2019

FIGURE **III.B-1**

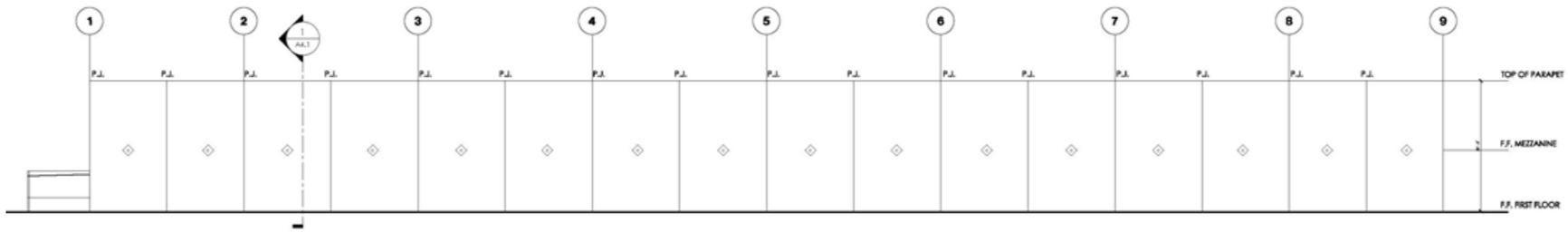
Meridian Consultants

Conceptual Site Plan

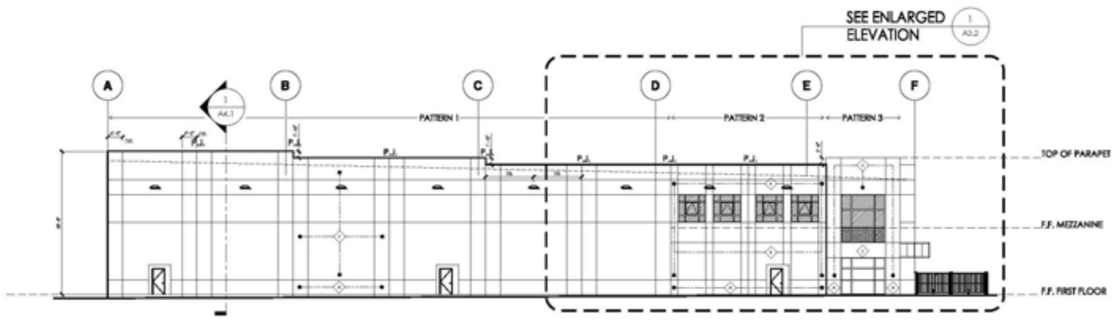
058-006-18



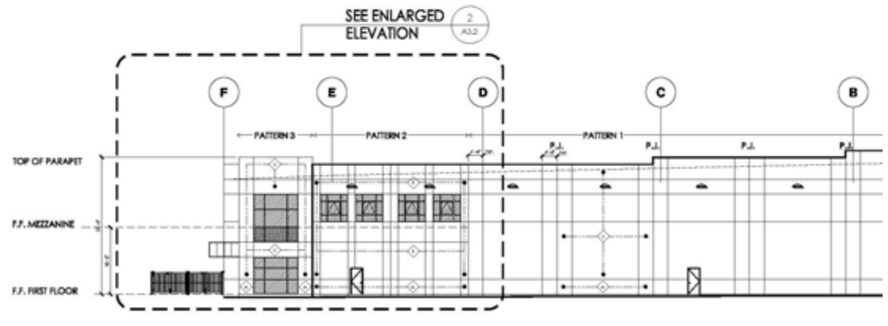
A NORTH ELEVATION
SCALE 1/16" = 1'-0"



D SOUTH ELEVATION
SCALE 1/16" = 1'-0"



B EAST ELEVATION
SCALE 1/16" = 1'-0"



C WEST ELEVATION
SCALE 1/16" = 1'-0"

SOURCE: O. C. Design & Engineering - 2019

FIGURE **III.B-2**

Meridian Consultants

Building 1 Elevation

058-006-18

SOURCE: O. C. Design & Engineering - 2019

FIGURE **III.B-3**

Meridian Consultants

Project Rendering - Aerial

058-006-18

SOURCE: O. C. Design & Engineering - 2019

FIGURE **III.B-4**

Meridian Consultants

Project Rendering - Perspective

058-006-18

IV. ENVIRONMENTAL IMPACT ANALYSIS
A. CUMULATIVE FREEWAY ANALYSIS

The Cumulative Freeway Analysis considers the potential cumulative impacts to freeway facilities from the proposed Project and related projects located within 2 miles of the proposed Project site. The analysis isolates and assesses the potential impact of Project traffic on Year 2035 cumulative freeway conditions along Interstate 10 (I-10) at Alameda Street. The analyses conducted of freeway facilities evaluated four mainline segments of the I-10 freeway (eastbound and westbound segments both east and west of Alameda Street), the two signalized I-10/Alameda Street ramp intersections, and two off-ramp locations.

This section incorporates information from the January 22, 2019, *Cumulative Analysis of Freeway Facilities* prepared by Gibson Transportation Consulting, Inc., which is provided in Appendix A. The *Cumulative Analysis of Freeway Facilities* document supplements the *Addendum to Traffic Impact Study, 4051 S. Alameda Street Alameda Industrial Park Warehouse, Los Angeles, California* (2014 Addendum) dated October 3, 2014 and prepared by Traffic Design, Inc., contained in Appendix IX to the January 2015 Draft EIR.

A. METHODOLOGY

The Cumulative Freeway Analysis was conducted using the Transportation Research Board's *Highway Capacity Manual,* 6th edition (HCM),[1] methodology. The HCM methodology was used to determine the Level of Service (LOS) for the freeway mainline facilities and is the underlying methodology in the Vistro software used to determine the vehicle delay and LOS at each ramp intersection. The analyses conducted on California Department of Transportation (Caltrans) facilities addresses the following four freeway mainline segments (eastbound and westbound segments both east and west of Alameda Street), two signalized ramp intersections,[2] and two off-ramp locations identified on **Figure IV.A-1: Project Study Area** and **Table IV.A-1: Freeway Facilities Analyzed.**

1 National Research Council, Transportation Research Board, *Highway Capacity Manual: A Guide for Multimodal Mobility Analysis,* 6th ed. (Washington, DC: Transportation Research Board, 2016).

2 The westbound I-10 off-ramp at Alameda Street is a single-lane ramp that widens to two lanes just prior to intersecting with E. 14th Street. The two lanes of the off-ramp free-flow onto E. 14th Street approaching the traffic signal at Alameda Street. Westbound traffic on E 14th Street faces a stop sign and, thus, traffic from the off-ramp has the right-of-way approaching Alameda Street. Field observations of the off-ramp operation indicate that the traffic signal at Alameda and E. 14th Streets creates queues that control the operation of the off-ramp. Therefore, this analysis treats the off-ramp as a signalized ramp with queues forming behind the Alameda E. 14th Streets traffic signal and extending onto the ramp.

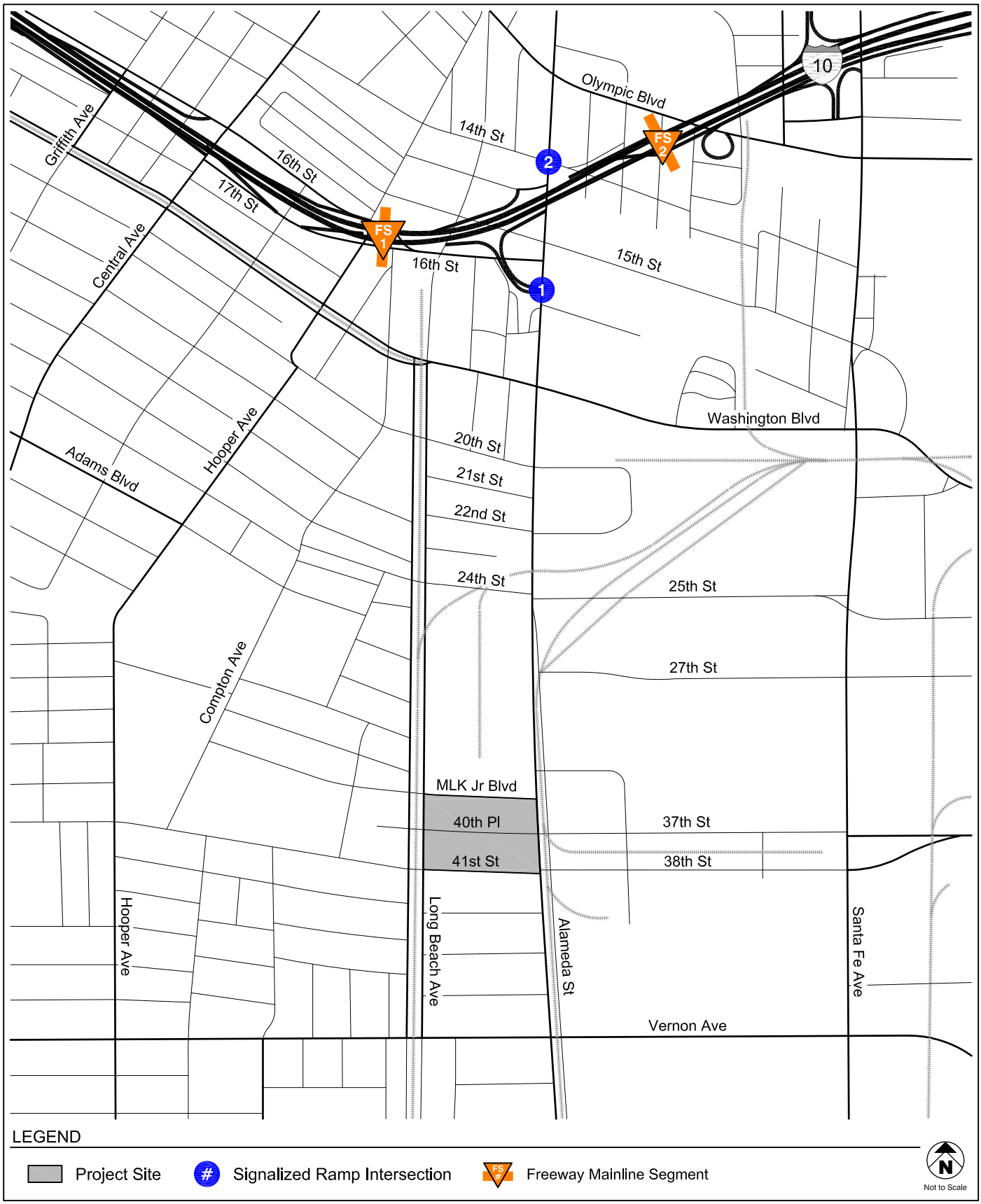
Table IV.A-1
Freeway Facilities Analyzed

Map ID	Location
Freeway Mainline Segments	
FS-1a	I-10 Eastbound between San Pedro Street/Central Avenue & Alameda Street
FS-1b	I-10 Westbound between San Pedro Street/Central Avenue & Alameda Street
FS-2a	I-10 Eastbound between Alameda Street & Santa Fe Avenue
FS-2b	I-10 Westbound between Alameda Street & Santa Fe Avenue
Signalized Ramp Intersections	
S-1	Alameda Street & I-10 Eastbound Ramps
S-2	Alameda Street & 14th Street / I-10 Westbound Off-Ramp
Off-ramp Queues	
Q-1	Alameda Street & I-10 Eastbound Off-Ramp
Q-2	Alameda Street & I-10 Westbound Off-Ramp

The methodology used to evaluate each type of freeway facility under the jurisdiction of Caltrans is described below:

- The four freeway mainline segments on I-10 were analyzed using the HCM methodology to determine density, speed, and LOS, consistent with Caltrans District 7 requirements. The LOS definitions for freeway mainline segments based on HCM methodology are presented in **Table IV.A-2: Freeway Segment Level of Service.**
- The two intersections located at freeway ramps and under partial Caltrans jurisdiction were analyzed using HCM methodology to identify vehicle delay and LOS. The LOS definitions for intersections based on HCM methodology are presented in **Table IV.A-3**: **Intersection Level of Service**.
- The two freeway off-ramps were analyzed for ramp queue lengths using the Vistro software to estimate queues.

The analysis reviewed the potential for traffic generated by the Project to contribute to cumulative impacts on Caltrans facilities during two timeframes. The analysis examines an "Existing Scenario" (Year 2014) that considers conditions in 2014, consistent with Section 15125 of the CEQA Guidelines. This section of the CEQA Guidelines states that physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation of an EIR is published, will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. The notice of preparation for the EIR was released in June 2014 and, accordingly, the Existing Scenario addresses freeway conditions in 2014.



SOURCE: Gibson Transportation Consulting – January 2019

FIGURE **IV.A-1**

Meridian Consultants

Project Study Area

Table IV.A-2
Freeway Segment Level of Service

Level of Service	Description	Density[a]
A	Free-flow speeds prevail. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream.	≤ 11
B	Free-flow speeds are maintained. The ability to maneuver with the traffic stream is only slightly restricted.	> 11 and ≤ 18
C	Flow with speeds at or near free-flow speeds. Freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver.	> 18 and ≤ 26
D	Speeds decline slightly with increasing flows. Freedom to maneuver with the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort.	> 26 and ≤ 35
E	Operation at capacity. There are virtually no usable gaps within the traffic stream, leaving little room to maneuver. Any disruption can be expected to produce a breakdown with queuing.	> 35 and ≤ 45
F	Represents a breakdown in flow and oversaturated conditions.	> 45

Source: *Highway Capacity Manual, 6th Edition, A Guide for Multimodal Mobility Analysis* (Transportation Research Board, 2016) (HCM methodology) and Caltrans.

Notes:

[a] Density is defined in vehicles per mile per lane and describes the proximity to other vehicles and is related to the freedom to maneuver within the traffic stream (HCM methodology).

Table IV.A-3
Intersection Level of Service

Level of Service	Description	Delay[a] Signalized Intersections
A	**EXCELLENT**. No vehicle waits longer than one red light and no approach phase is fully used.	≤ 10
B	**VERY GOOD**. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.	> 10 and ≤ 20
C	**GOOD**. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.	> 20 and ≤ 35
D	**FAIR**. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.	> 35 and ≤ 55
E	**POOR**. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.	> 55 and ≤ 80
F	**FAILURE**. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Tremendous delays with continuously increasing queue lengths.	> 80

Source: *Highway Capacity Manual, 6th Edition, A Guide for Multimodal Mobility Analysis* (Transportation Research Board, 2016).

Notes:

[a] Measured in seconds.

In addition, in accordance with Caltrans's policy to conduct long-term planning for the state highway facilities and consistent with the Southern California Association of Governments' (SCAG) 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS): Towards a Sustainable Future (Southern California Association of Governments, April 2012),[3] the analysis evaluates projections of Year 2035 conditions.[4] The analysis of

3 Southern California Association of Governments, *The 2012–2035 Regional Transportation Plan/Sustainable Communities Strategy: Towards a Sustainable Future (April 2012),* accessed February 2019, http://rtpscs.scag.ca.gov/Documents/2012/final/f2012RTPSCS.pdf.

4 References to Southern California Association of Governments, *The 2012–2035 Regional Transportation Plan/Sustainable Communities Strategy: Towards a Sustainable Future* (April 2012) were used to be consistent with the prior analysis years.

freeway facilities for both the Existing Scenario (Year 2014) and Year 2035 evaluates conditions with and without Project traffic.

B. PROPOSED PROJECT

The proposed Project consists of the construction of a warehousing and manufacturing facility to include up to 466,120 square feet of warehouse and ancillary office space and 14,000 square feet of manufacturing space in four buildings. The proposed Project site, which is currently vacant and free of any structures, is bounded by Martin Luther King Jr. Boulevard to the north, Alameda Street to the east, 41st Street to the south, and Long Beach Avenue to the west. The proposed Project site is located approximately 1.2 miles south of I-10, approximately 2.5 miles east of I-110, and approximately 3.8 miles west of I-710. Project traffic is anticipated to generate the highest traffic levels along I-10, and thus, the analysis below focuses on Project trips along I-10. Access to the proposed Project site would be provided via four driveways along Martin Luther King Jr. Boulevard and four driveways along 41st Street.

1. Trip Generation

Trip generation for the proposed Project as reported in the 2014 Addendum[5] was estimated based on the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 9th edition.[6] In addition, appropriate trip reductions to account for transit usage, as allowed by the City of Los Angeles Department of Transportation (LADOT) and conversion of truck trips to passenger car equivalent (PCE) trips were applied to the ITE base trip rates.

The proposed Project is estimated to generate 1,968 daily PCE trips, including 179 PCE trips during the morning peak hour (140 PCE inbound and 39 PCE outbound trips), and 190 PCE trips during the afternoon peak hour (50 PCE inbound and 140 PCE outbound trips). Distribution of Project traffic to the local and regional networks used for this analysis is consistent with the distribution pattern in the previous traffic studies prepared for the proposed Project.

C. RELATED PROJECTS

The Cumulative Freeway Analysis considers the potential cumulative impacts from the proposed Project, and the related projects identified and described in **Table II.B-1: Related Projects**, in

5 Traffic Design, Inc., *Addendum to Traffic Impact Study, 4051 S. Alameda Street Alameda Industrial Park Warehouse, Los Angeles, California* (October 3, 2014).
6 Institute for Transportation Engineers (ITE), *Trip Generation Manual,* 9th ed. (Washington, DC: ITE, 2012).

Section II: Environmental Setting of this PRDEIR, and the ambient growth rate of 1 percent annually. The list in **Table II.B-1** includes past, current, and future projects identified by the City for consideration in the cumulative impact analysis in the EIR, consistent with the guidance provided in LADOT's *Traffic Study Policies and Procedures*.[7]

D. FREEWAY MAINLINE SEGMENT ANALYSIS—2014

The eastbound and westbound travel lanes on four freeway mainline facilities on the I-10 both east and west of Alameda Street were analyzed using freeway volume data from 2014 Traffic Volumes on California State Highways (Caltrans, 2015) to reflect Existing Scenario (Year 2014) and is summarized in the first two columns of **Table IV.A-4: Freeway Mainline Segment Traffic Volumes**.

The results of the HCM analysis for the Existing and Existing with Project Scenarios is presented in **Table IV.A-5**: **Existing Operating Scenarios (Year 2014)—Freeway Segment Level of Service Evaluation**. This analysis shows that two westbound freeway segments are operating above their capacity without the addition of traffic from the proposed Project. With the addition of Project traffic, one of the remaining segments studied would experience a minimal decrease of 0.1 miles per hour operating speed during the afternoon peak hour, and operating density for all remaining segments would increase by a maximum of only 0.2 vehicles per mile per hour.

As shown in **Table IV.A-5**, Project traffic either does not affect existing operations or results in very small incremental increases and, therefore, the addition of Project traffic on the mainline facilities will not result in significant cumulative impacts.

E. FREEWAY MAINLINE SEGMENT ANALYSIS—2035

Traffic volumes projected for Year 2035 are presented in the last two columns of **Table IV.A-4**. The existing traffic volumes were increased by both ambient growth (assumed to be 1 percent per year) and cumulative related-Project traffic as shown in **Table IV.A-5**.

The Los Angeles County Metropolitan Transportation Authority's *2010 Los Angeles County Congestion Management Program* (CMP)[8] provides general growth factors based on regional

7 Los Angeles Department of Transportation, *Traffic Study Policies and Procedures* (August 2014).
8 Los Angeles County Metropolitan Transportation Authority, *2010 Los Angeles County Congestion Management Program* (2010), accessed February 2019, http://media.metro.net/docs/cmp_final_2010.pdf.

modeling. As shown in Exhibit D-1 of the CMP, the proposed Project site is located in Regional Statistical Area 11 (Vernon), which is estimated to experience a total regional growth in traffic of 18.2 percent between the years of 2010 and 2035. This equates to an ambient growth factor of approximately 0.73 percent per year. Accordingly, the assumed ambient growth factor of 1 percent per year used to estimate future traffic volumes over the 21-year period is conservative.

The results of the HCM analysis for Year 2035 Future without Project Scenario and Future with Project Scenario are presented in **Table IV.A-6: Future Operating Scenarios (Year 2035)—Freeway Segment Level of Service Evaluation**.

The mainline freeway segment analysis shows that in Year 2035, four of the eight segments (both directions of travel for the four segments analyzed) evaluated will operate above their capacity without the addition of traffic from the proposed Project. **Table IV.A-4** shows that the Project traffic to be added to these freeway segments totals between 6 and 22 Project vehicles per hour compared to Year 2035 traffic levels of between 10,900 and 16,300 vehicles *per direction, per hour*. **Table IV.A-6** shows that the change in operating density on the four measured segments is a maximum change of 0.1 vehicles per mile per hour. There is no change in operating speed as a result of adding this negligible amount of Project traffic to the four freeway segments. The incremental changes that would result from the addition of traffic from the Project are very small and; therefore, the addition of Project traffic on the mainline facilities through the 2035 horizon will not result significant cumulative impacts.

Table IV.A-4
Freeway Mainline Segment Traffic Volumes

ID	Freeway Mainline Segment	Peak Hour	Direction	Vehicles per Hour (VPH)				
				Existing Scenario (Year 2014)[a]	Existing with Project Scenario (Year 2014)	Future without Project Scenario (Year 2035)	Future with Project Scenario (Year 2035)	Project-Only Volumes
FS-1	I-10 between San Pedro Street/Central Avenue & Alameda Street	A.M.	EB	7,636	7,657	9,431	9,452	21
			WB	11,472	11,478	14,151	14,157	6
		P.M.	EB	9,895	9,903	12,199	12,207	8
			WB	7,246	7,267	8,935	8,956	21
FS-2	I-10 between Alameda Street & Santa Fe Avenue	A.M.	EB	7,826	7,833	9,656	9,663	7
			WB	11,758	11,778	14,501	14,521	20
		P.M.	EB	10,142	10,164	12,503	12,525	22
			WB	7,426	7,433	9,156	9,163	7

Source: Gibson Transportation Consulting, Cumulative Analysis of Freeway Facilities, 4051 South Alameda Street, Alameda Industrial Park Warehouse, Los Angeles, California (January 22, 2019), 16.

Notes:

[a] Traffic volume data from traffic count data from 2014 Traffic Volumes on California State Highways (Caltrans, 2015) were used to be consistent with the analysis years in the 2014 Addendum.

Table IV.A-5
Existing Operating Scenarios (Year 2014)
Freeway Segment Level of Service Evaluation

ID	Freeway Segment	Peak Hour	Direction	Existing Scenario			Existing with Project Scenario			Impact
				Speed[a,b]	Density[b,c]	LOS	Speed[a,b]	Density[b,c]	LOS	
FS-1	I-10 between San Pedro Street/Central Avenue & Alameda Street	A.M.	EB	52.4	31.8	D	52.4	31.9	D	**NO**
			WB	Overflow	Overflow	F	Overflow	Overflow	F	**NO**
		P.M.	EB	50.5	42.7	E	50.5	42.8	E	**NO**
			WB	52.4	30.2	D	52.4	30.3	D	**NO**
FS-2	I-10 between Alameda Street & Santa Fe Avenue	A.M.	EB	52.4	32.6	D	52.4	32.6	D	**NO**
			WB	Overflow	Overflow	F	Overflow	Overflow	F	**NO**
		P.M.	EB	49.6	44.6	E	49.5	44.8	E	**NO**
			WB	52.4	30.9	D	52.4	30.9	D	**NO**

Source: Gibson Transportation Consulting, Cumulative Analysis of Freeway Facilities, 4051 South Alameda Street, Alameda Industrial Park Warehouse, Los Angeles, California *(January 22, 2019), (17).*

Notes:
1. Overflow: Traffic demand exceeds the available capacity of the freeway mainline segment.

a Mean speed measured in miles per hour (mph).

b Methodology from *Highway Capacity Manual, 6th Edition, A Guide for Multimodal Mobility Analysis* (Transportation Research Board, 2016) (HCM methodology).

c Measured in vehicles per mile per lane (v/m/l) for freeways with a free-flow speed of 58.2 mph. Free-flow speed, as defined in HCM methodology, is the theoretical speed when the density and flow rate of the freeway mainline segment are both zero.

Table IV.A-6
Future Operating Scenarios (Year 2035)
Freeway Segment Level of Service Evaluation

ID	Freeway Segment	Peak Hour	Direction	Future without Project Scenario			Future with Project Scenario			Impact
				Speed[a,b]	Density[b,c]	LOS	Speed[a,b]	Density[b,c]	LOS	
FS-1	I-10 between San Pedro Street/Central Avenue & Alameda Street	A.M.	EB	51.7	39.8	E	51.7	39.9	E	NO
			WB	Overflow	Overflow	F	Overflow	Overflow	F	NO
		P.M.	EB	Overflow	Overflow	F	Overflow	Overflow	F	NO
			WB	52.3	37.3	E	52.3	37.4	E	NO
FS-2	I-10 between Alameda Street & Santa Fe Avenue	A.M.	EB	51.2	41.1	E	51.2	41.2	E	NO
			WB	Overflow	Overflow	F	Overflow	Overflow	F	NO
		P.M.	EB	Overflow	Overflow	F	Overflow	Overflow	F	NO
			WB	52.1	38.3	E	52.1	38.4	E	NO

Source: Gibson Transportation Consulting, Cumulative Analysis of Freeway Facilities, 4051 South Alameda Street, Alameda Industrial Park Warehouse, Los Angeles, California *(January 22, 2019), (19).*

Notes:

1. Overflow: Traffic demand exceeds the available capacity of the freeway mainline segment.

a Mean speed measured in miles per hour (mph).

b Methodology from *Highway Capacity Manual, 6th Edition, A Guide for Multimodal Mobility Analysis* (Transportation Research Board, 2016) (HCM methodology).

c Measured in vehicles per mile per lane (v/m/l) for freeways with a free-flow speed of 58.2 mph. Free-flow speed, as defined in HCM methodology, is the theoretical speed when the density and flow rate of the freeway mainline segment are both zero.

F. PROPORTION OF GROWTH CONTRIBUTION BY PROJECT TRAFFIC—YEAR 2035

As shown in **Table IV.A-7: Proportion of Projected Future Traffic—Future Year 2035 Scenarios**, the proposed Project would add between six and 22 PCE trips per hour in one direction to the four mainline facility segments studied during either the morning or afternoon peak hours. Caltrans does not identify specific incremental criteria by which to measure the significance of impacts to freeway mainline segments.

While the proposed Project would contribute to future 2035 cumulative traffic growth on the freeway system, the Project traffic represents 0.2–1.20 percent of the projected growth on the freeway segments between 2014 and 2035. Project traffic averages 0.66 percent of the new traffic growth on the four freeway segments during the peak periods of the day. The highest Project traffic growth on any of the freeway mainline segments analyzed would represent the addition of one car every 15 minutes per lane of freeway. This negligible incremental increase is not cumulatively considerable because the operating conditions of the freeway segments would not be affected.

G. CUMULATIVE ANALYSIS OF INTERCHANGE INTERSECTIONS

Two signalized freeway ramp intersections on the I-10/Alameda Street interchange were evaluated using the HCM methodology and implemented using the Vistro software.

1. Intersection Analysis—Year 2014

Table IV.A-8: Existing with Project Scenarios (Year 2014)—Intersection Peak-Hour Levels of Service summarizes the results of the signalized HCM analysis for Existing and Existing with Project Scenarios for Year 2014.

The addition of Project traffic would result in an increase in intersection delay of 0.1 to 0.9 seconds. Because Caltrans does not have a threshold for significant impacts at intersections, the LADOT threshold of significance was used. Under the LADOT threshold, an increase in intersection delay of 6.0 seconds at LOS C and 4.0 seconds at LOS D is considered a significant impact.[9]

9 *Traffic Study Policies and Procedures*, Los Angeles Department of Transportation, August 2014, page 16.

Table IV.A-8 shows that the two study interchange intersections would operate at LOS B or C with or without the proposed Project in place. Neither intersection would experience an increase in delay approaching the LADOT thresholds and, therefore, no significant cumulative impact would result.

2. Cumulative Intersection Analysis—Year 2035

The 2035 traffic volumes were developed by increasing the existing traffic volumes with both ambient growth (assumed to be 1 percent per year) and traffic from related projects. **Table IV.A-9: Future with Project Scenarios (Year 2035)** summarizes the results of the signalized HCM analysis for Future without and with Project Scenarios for Year 2035. The ramp intersections are anticipated to operate at LOS D or better under all scenarios, regardless of the addition of Project traffic. With an operation of LOS C or D, the incremental increases in delay resulting from the addition of Project traffic would be in the 0.7 to 3.1 second range—below the LADOT threshold for significance. Therefore, no significant cumulative impacts would result.

H. CUMULATIVE ANALYSIS OF OFF-RAMP QUEUES

Two off-ramps from I-10 were analyzed to determine whether the lengths of the ramps were sufficient to accommodate vehicle queue lengths. The queue lengths were estimated using Vistro, which reports the 95th percentile queue length, in feet, for each approach lane on the off-ramp.

Table IV.A-7
Proportion of Projected Future Traffic
Future Year 2035 Scenarios

ID	Freeway Mainline Segment	Peak Hour	Direction	Vehicles per Hour (VPH)				Proportion of Project-Related Traffic
				Existing	Background Growth (Ambient Growth + Related Project Traffic)	Project	Total Growth	
FS-1	I-10 between San Pedro Street/Central Avenue & Alameda Street	A.M.	EB	7,636	1,795	21	1,816	1.20%
			WB	11,472	2,679	6	2,685	0.20%
		P.M.	EB	9,895	2,304	8	2,312	0.30%
			WB	7,246	1,689	21	1,710	1.20%
FS-2	I-10 between Alameda Street & Santa Fe Avenue	A.M.	EB	7,826	1,830	7	1,837	0.40%
			WB	11,758	2,743	20	2,763	0.70%
		P.M.	EB	10,142	2,361	22	2,383	0.90%
			WB	7,426	1,730	7	1,737	0.40%
				Average Proportion of Project-Related Traffic to Mainline Segments				**0.66%**

Source: Gibson Transportation Consulting, Cumulative Analysis of Freeway Facilities, 4051 South Alameda Street, Alameda Industrial Park Warehouse, Los Angeles, California *(January 22, 2019), 20.*

Table IV.A-8
Existing with Project Scenarios (Year 2014)
Intersection Peak-Hour Levels of Service

No.	Intersection	Peak Hour	Existing Scenario		Existing with Project Scenario		Impact
			Delay	LOS	Delay	LOS	
S-1	Alameda Street & I-10 Eastbound Ramps	A.M.	20.1	C	21.0	C	**NO**
		P.M.	24.8	C	25.7	C	**NO**
S-2	Alameda Street & 14th Street / I-10 Westbound Off-Ramp	A.M.	18.1	B	18.4	B	**NO**
		P.M.	22.5	C	22.6	C	**NO**

Source: Gibson Transportation Consulting, Cumulative Analysis of Freeway Facilities, 4051 South Alameda Street, Alameda Industrial Park Warehouse, Los Angeles, California *(January 22, 2019), 22.*

Notes:
1. Delay is measured in seconds per vehicle.
2. LOS = Level of Service.
3. Results per Vistro (HCM methodology).

Table IV.A-9
Future with Project Scenarios (Year 2035)
Intersection Peak-Hour Levels of Service

No.	Intersection	Peak Hour	Existing Scenario		Existing with Project Scenario		Impact
			Delay	LOS	Delay	LOS	
S-1	Alameda Street & I-10 Eastbound Ramps	A.M.	27.0	C	28.0	C	**NO**
		P.M.	40.2	D	43.3	D	**NO**
S-2	Alameda Street & 14th Street / I-10 Westbound Off-Ramp	A.M.	31.0	C	31.7	C	**NO**
		P.M.	46.5	D	47.4	D	**NO**

Source: Gibson Transportation Consulting, Cumulative Analysis of Freeway Facilities, 4051 South Alameda Street, Alameda Industrial Park Warehouse, Los Angeles, California *(January 22, 2019), 22.*

Notes:
1. Delay is measured in seconds per vehicle.
2. LOS = Level of Service.
3. Results per Vistro (HCM methodology).

The assessment of the off-ramps included a review of the vehicle queue length as compared to the total available queuing capacity of the ramp to determine whether the vehicle queue would extend beyond the length of the ramp onto the mainline. The queuing analysis looks at two separate components of ramp capacity: (1) the length of each approach lane to the intersection, and (2) the remaining length of the ramp, behind any approach lane delineation lines, to the gore point[10] where the ramp diverges from the freeway mainline. The queue may exceed the striped length of a given approach lane, as long as there is sufficient additional queuing capacity on the ramp so that the queue will not spill over onto the mainline.

1. Off-Ramp Queue Analysis—Year 2014

The analysis of Year 2014 scenarios was conducted using traffic count data utilized for the Existing Scenario analysis per the 2014 Addendum. **Table IV.A-10: Freeway Off-Ramp Queue Evaluation—Existing Operating Scenarios (Year 2014)** summarizes the results of the queuing analysis for Existing Scenario and Existing with Project Scenario for Year 2014.

The Year 2014 analysis shows that with and without the addition of traffic from the proposed Project, sufficient queue length on the off-ramps is available that neither the morning or the afternoon peak hours at either ramp would experience a condition whereby the queue extended onto the mainline freeway lanes. The same condition exists for the Year 2014 scenario with Project traffic. The addition of Project traffic would not cause either of the off-ramps to back up onto the mainline freeway lanes. Therefore, the addition of Project traffic will not contribute to a significant cumulative impact at either ramp location.

2. Cumulative Off-Ramp Queue Analysis—Year 2035

The Year 2035 traffic volumes were developed by increasing the existing traffic volumes by both ambient growth (assumed to be 1 percent per year) and traffic from related projects. **Table IV.A-11 Freeway Off-Ramp Queue Evaluation—Future Operating Scenarios (Year 2035)** summarizes the results of the Year 2035 queuing analysis with and without Project traffic.

The queues at the two off-ramps do not extend beyond the available capacity with and without the addition of Project traffic. The addition of Project traffic does not substantially increase the off-ramp queue under any of the scenarios tested above (less than one vehicle length during

10 The area between a through roadway and an exit ramp. This term may also refer to the similar area between a through roadway and a converging entrance ramp. California Department of Transportation, *Highway Design Manual* (2017), p. 60-5.

any of the scenarios tested). Therefore, the addition of Project traffic will not contribute to a significant cumulative impact at either ramp location.

I. ADDITIONAL CUMULATIVE ANALYSIS

Additional alternative cumulative freeway analysis was prepared, for informational purposes only, that evaluates cumulative freeway traffic conditions with traffic generated by the proposed Project, the 11 related projects identified by the City for the analysis of potential cumulative impacts with the proposed Project, and the Reef (SOLA Village) project and the 82 related projects identified in the September 2015 Draft EIR prepared for the SOLA Village project.

The SOLA Village project is located immediately south of Downtown Los Angeles and the I-10 freeway on South Broadway Street. The SOLA Village EIR assumed full development of this Project by 2035. Due to the location of the SOLA Village project, the related projects identified by the City for the analysis of potential cumulative impacts with the SOLA Village project primarily consist of related projects located north of the I-10 in Downtown Los Angeles, almost all of which are located more than two miles away from the proposed Project site. The list of SOLA Village related projects is presented in Table A-4 in Appendix A of the Cumulative Analysis of Freeway Facilities Study in Appendix I. The City received comments on the Draft EIR for the Project asking if the related projects considered in the SOLA Village EIR should have been considered in the cumulative impact analysis of the Project. The related projects lists for both projects were determined by the City based on the location and other characteristics, such as the projected build-out year, of each of these projects. In response to these comments, additional analysis of potential cumulative freeway impacts considering the related projects in the SOLA Village EIR, while not required, was completed to provide additional information on potential cumulative freeway traffic impacts. This additional 2035 freeway cumulative analysis identified no significant cumulative impacts from the proposed Project on the freeway mainline segments, interchange intersections, or freeway off-ramp queues with the addition of traffic from the SOLA Village project and the 82 related projects identified by the City for the analysis of potential cumulative impacts in the SOLA Village EIR.

Because of the larger growth in background traffic caused by the additional related projects, the proportion of growth associated with Project traffic is reduced to less than 1 percent of the total growth (0.34 percent) evaluated in this additional analysis.

Table IV.A-10
Freeway Off-Ramp Queue Evaluation
Existing Operating Scenarios (Year 2014)

				Existing Scenario				Existing with Project Scenario			
				A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
ID	Freeway Off-ramp	Ramp and Lane Description	Vehicle Storage Capacity[a]	Vehicle Queue Length[b]	Exceeds Capacity?	Vehicle Queue Length[b]	Exceeds Capacity?	Vehicle Queue Length[b]	Exceeds Capacity?	Vehicle Queue Length[b]	Exceeds Capacity?
Q-1	Alameda Street & I-10 Eastbound Ramps	I-10 Eastbound Off-Ramp									
		Left	255	255		255		255		255	
		Right	255	255		255		255		255	
		Ramp	870	130	**NO**	321	**NO**	142	**NO**	309	**NO**
Q-2	Alameda Street & 14th Street / I-10 Westbound Off-Ramp	I-10 Westbound Off-Ramp									
		Left	220	143		174		148		178	
		Shared Left/Through	350	144		172		149		175	
		Right	350	21		40		21		40	
		Ramp	890	0	**NO**	0	**NO**	0	**NO**	0	**NO**

Source: Gibson Transportation Consulting, Cumulative Analysis of Freeway Facilities, 4051 South Alameda Street, Alameda Industrial Park Warehouse, Los Angeles, California *(January 22, 2019), 24.*

Notes:

[a] Expressed in feet.

[b] 95th Percentile queue results per Vistro (HCM Methodology).

Table IV.A-11
Freeway Off-Ramp Queue Evaluation
Future Operating Scenarios (Year 2035)

			Future without Project Scenario				Future with Project Scenario			
				A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
ID	Freeway Off-ramp	Ramp and Lane Description	Vehicle Storage Capacity[a]	Vehicle Queue Length[b]	Exceeds Capacity?	Vehicle Queue Length[b]	Exceeds Capacity?	Vehicle Queue Length[b]	Exceeds Capacity?	Vehicle Queue Length[b]	Exceeds Capacity?
Q-1	Alameda Street & I-10 Eastbound Ramps	I-10 Eastbound Off-Ramp									
		Left	255	255		255		255		255	
		Right	255	255		255		255		255	
		Ramp	870	349	**NO**	460	**NO**	379	**NO**	460	**NO**
Q-2	Alameda Street & 14th Street / I-10 Westbound Off-Ramp	I-10 Westbound Off-Ramp									
		Left	220	200		220		218		220	
		Shared Left/Through	350	195		342		210		350	
		Right	350	25		50		25		50	
		Ramp	890	0	**NO**	152	**NO**	0	**NO**	172	**NO**

Source: Gibson Transportation Consulting, Cumulative Analysis of Freeway Facilities, 4051 South Alameda Street, Alameda Industrial Park Warehouse, Los Angeles, California *(January 22, 2019), 25.*

Notes:

[a] Expressed in feet.

[b] 95th Percentile queue results per Vistro (HCM Methodology).

IV. ENVIRONMENTAL IMPACT ANALYSIS
B. CUMULATIVE ANALYSIS—OTHER TOPICS

Section 15130 of the CEQA Guidelines requires that an EIR consider the significant environmental effects of a project and the potential for a project to contribute to significant cumulative impacts. A cumulative impact is defined as an impact that is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts (CEQA Guidelines Section 15355).

As stated in the CEQA Guidelines Section 15130(a)(1), the cumulative impact discussion in an EIR need not discuss impacts that do not result in part from the project evaluated in the EIR. Section 15125 (a)(1) of the CEQA Guidelines states that, generally, a lead agency should describe and consider physical environmental conditions as they exist at the time the notice of preparation of an EIR is published.

CEQA Guidelines Section 15130(b)[1] states that an adequate discussion of significant cumulative impacts may be based on either (1) a list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency; or (2) a summary of projections contained in an adopted local, regional, or statewide plan, or related planning document, that describes or evaluates conditions contributing to the cumulative effect.

The January 2015 Draft EIR provided cumulative impact analyses in Section IV: *Environmental Impact Analysis,* in a subsection of the topical sections. Table II.B-1, *Related Projects,* provides information on the related projects identified by the City in June 2014, the date of the release of the Notice of Preparation of the DEIR (also see Figure II.B-1, *Related Projects*). The list in Table II.B-1 includes past, current, and probable future projects identified by the City for consideration in the cumulative impact analysis in the EIR, which assessed cumulative impacts in 2016, the projected opening year of the Project, consistent with the guidance provided in the Los Angeles Department of Transportation (LADOT) *Traffic Study Policies and Procedures*[1] document.

The cumulative impact analysis in the EIR considers the potential cumulative effects at the time the Project would be built (buildout year), which was projected at 2016 for the proposed Project.

1 Los Angeles Department of Transportation, *Traffic Study Policies and Procedures* (August 2014).

The Cumulative Freeway Analysis presented in **Section IV.A: Cumulative Freeway Analysis** of this PRDEIR assesses the potential impact of Project traffic on Year 2035 freeway conditions, which is Caltrans' definition of 2035 as its long-range planning horizon year.

A. OTHER TOPICS

A summary of the cumulative impact analyses for each of the other topics provided in the January 2015 Draft EIR is provided below. These analyses considered the related projects in assessing the potential for the Project to contribute to cumulative impacts in 2016, the buildout year for the Project. As discussed above, the additional analysis of Year 2035 freeway conditions was prepared in response to the long-range freeway planning horizon defined by Caltrans. Because the Year 2035 horizon is defined by Caltrans and uniquely pertains to the Cumulative Freeway Analysis, the Cumulative Freeway Analysis in this PRDEIR does not affect the methodology, approach, or conclusions for analysis of potential cumulative impacts in 2016 for the other topics addressed in the EIR, including air quality, cultural resources, greenhouse gas emissions, hazards and hazardous materials, land use and planning, local street network, and utilities and service systems as further discussed below for each topic. This is because this 2035 horizon was defined by Caltrans for purposes of long-range planning for the freeway system and, as such, is not applicable to other topics for this reason. In addition, the Writ required additional analysis only of cumulative freeway traffic impacts. All other portions of the EIR were determined to comply with CEQA. No additional or updated analysis of cumulative impacts for these other topics is, therefore, required by the Writ or as a result of the 2035 freeway cumulative impact analysis.

The January 2015 Draft EIR provided cumulative impact analyses for each environmental topic in Section IV: *Environmental Impact Analysis* that considered the related projects identified by the City for consideration in assessing the potential cumulative impacts of the Project. The additional analysis of Year 2035 freeway conditions does not affect or change the methodology, approach, or conclusions for cumulative analysis for the other topics in the Draft EIR because these analyses assessed cumulative impacts in 2016, the Project buildout year, pursuant to the CEQA Guidelines. For this reason, no additional or updated analysis of cumulative impacts for these other topics is necessary, as discussed further below for each topic evaluated in the EIR.

1. Air Quality

The analysis of potential cumulative air quality impacts was conducted in accordance with the methodology defined by the South Coast Air Quality Management District (SCAQMD), which

considers how cumulative development may affect implementation of the SCAQMD's Air Quality Management Plan. Because the proposed Project and the related projects would not induce substantial population growth, and the growth associated with the Project and related projects was determined to be consistent with the growth projections incorporated in the 2012 Air Quality Management Plan (AQMP), the AQMP in effect at the time the EIR was prepared, it was determined that the proposed Project would not affect the implementation of the AQMP. For this reason the Project would not contribute to significant cumulative air quality impacts. The additional analysis of Year 2035 freeway conditions does not affect or change the methodology, approach, or conclusions for the analysis of cumulative air quality impacts in the EIR, which evaluated the consistency of growth associated with the Project and related projects in 2016 with the growth projections in the 2012 AQMP.

According to the SCAQMD, construction of individual construction projects that exceed the SCAQMD recommended daily thresholds for project-specific impacts would cause a cumulatively considerable increase in emissions for those pollutants for which the South Coast Air Basin is a non-attainment area. The analysis in the January 2015 Draft EIR of emissions that would be generated by construction of the proposed Project determined this temporary impact would not be significant with implementation of the identified mitigation measures. Therefore, implementation of the proposed Project would not result in cumulative construction air quality impacts. The additional analysis of Year 2035 freeway conditions does not affect or change the methodology, approach, or conclusions for the analysis of cumulative construction air quality impacts in the EIR, as this analysis evaluates the significance of daily emissions during construction of the Project based on an opening year of 2016, consistent with the SCAQMD guidelines for evaluating construction impacts.

2. Cultural Resources

The incremental impact of the proposed Project on paleontological resources, archaeological resources, historical resources, and human remains was determined to be less than significant with the implementation of the mitigation measures identified in the January 2015 Draft EIR. The potential impacts of the Project on these resources would be limited to resources on the Project site. For these reasons, the Project would not contribute to potential cumulative impacts on cultural resources when considered with the related projects identified by the City for consideration in the analysis of the potential cumulative impacts of the Project in 2016, the projected opening year of the Project, and no additional analysis is necessary a result of the additional analysis of 2035 freeway conditions.

3. Greenhouse Gas Emissions

The Project and related projects would be designed and constructed in accordance with the City of Los Angeles Green Building Code, developed to assist the City in meeting applicable statewide, regional, and local goals and policies for the reduction of greenhouse gas (GHG) emissions. Additionally, the Project would provide the opportunity for industrial uses to locate along the Alameda Corridor, with immediate access to rail lines and major interstates and highways, which would reduce mobile emissions in comparison to industrial land uses in other locations in the City. For these reasons, the Project would not contribute to significant cumulative GHG emission impacts when considered with related projects. The additional analysis of Year 2035 freeway conditions does not affect or change the methodology, approach, or conclusions for the analysis of cumulative GHG emission impacts in the EIR, which addressed potential impacts with buildout of the Project in 2016.

4. Hazards and Hazardous Materials

The January 2015 Draft EIR determined the Project would not create significant hazards or generate substantial or significant amounts of hazardous waste. Based on a review of the location and characteristics of the related projects considered in the cumulative impact analysis, it was determined that the Project would not contribute to significant cumulative hazards or hazardous materials impacts when analyzed in conjunction with related projects. The additional analysis of Year 2035 freeway conditions does not affect or change the methodology, approach, or conclusions for the analysis of hazards or hazardous materials impacts in the EIR, which addressed potential impacts with buildout of the Project in 2016.

5. Land Use and Planning

The Project is consistent with the General Plan land use designation and zoning for the Project site and with the City's planning objectives for industrial uses within the Alameda Corridor. For this reason, the Project would not contribute to any cumulative land use and planning impacts when considered with the related projects in the City's Southeast Los Angeles Community Planning area. The additional analysis of Year 2035 freeway conditions does not affect or change the methodology, approach, or conclusions for this analysis of potential cumulative land use impacts with buildout of the Project in 2016.

6. Transportation/Traffic—Local Street Network

The analysis of potential cumulative impacts to local streets and intersections in the January 2015 Draft EIR was conducted in accordance with LADOT's *Traffic Study Policies and Procedures* assessing potential cumulative impacts in 2016, the projected opening year for the Project. The additional analysis of cumulative freeway conditions provided in this PRDEIR does not affect the analysis of cumulative impacts on the local street system in the Final EIR. For this reason, the conclusions in the Final EIR on cumulative impacts on the local street system remain unchanged. No additional analysis of potential cumulative impacts on the City's local street network is necessary as a result of the additional analysis of 2035 freeway conditions, as this cumulative local street network analysis was conducted for the 2016 buildout year of the Project, consistent with LADOT policies and procedures.

APPENDIX A

Cumulative Freeway Traffic Impact Analysis Study

CUMULATIVE ANALYSIS OF FREEWAY FACILITIES

4051 SOUTH ALAMEDA STREET
ALAMEDA INDUSTRIAL PARK WAREHOUSE

LOS ANGELES, CALIFORNIA

JANUARY 22, 2019

PREPARED FOR

CITY OF LOS ANGELES

PREPARED BY

Gibson
transportation consulting, inc.

CUMULATIVE ANALYSIS OF FREEWAY FACILITIES

4051 SOUTH ALAMEDA STREET
ALAMEDA INDUSTRIAL PARK WAREHOUSE

LOS ANGELES, CALIFORNIA

January 22, 2019

Prepared for:

CITY OF LOS ANGELES

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Executive Summary

The Alameda Industrial Park Warehouse Project ("Project") proposes the construction of a warehousing and manufacturing facility to include up to 466,120 square feet ("sf") of warehousing space, including ancillary office uses, and up to 14,000 sf of manufacturing space in four buildings. The Project Site, which is currently vacant and free of any structures, is bounded by Martin Luther King, Jr. Boulevard to the north, Alameda Street to the east, 41st Street to the south, and Long Beach Avenue to the west. The Project Site is located approximately 1.2 miles south of I-10, which is the closest freeway and, therefore, the freeway that is likely to experience the largest proportion of Project trips.

The Project is anticipated to generate 1,917 daily passenger car equivalent ("PCE") trips, including 167 PCE trips during the morning peak hour (133 PCE inbound and 34 PCE outbound trips) and 179 PCE trips during the afternoon peak hour (46 PCE inbound and 133 PCE outbound trips).

This Cumulative Analysis of Freeway Facilities ("Cumulative Freeway Analysis") has been prepared to provide additional cumulative freeway analysis required by the Peremptory Writ of Mandate ("Writ"), issued on January 8, 2019 in *Ponce, et al. v. City of Los Angeles, et. al.*, Los Angeles Superior Court Case No. BS 169426 ("*Ponce*"). This Cumulative Freeway Analysis supplements *Addendum to Traffic Impact Study, 4051 S. Alameda Street Alameda Industrial Park Warehouse, Los Angeles, California* (Traffic Design, Inc., October 3, 2014) ("2014 Addendum").

In *Ponce*, the Court, the Hon. James C. Chalfant presiding, upheld the 2014 Addendum analysis with respect to the Project's direct traffic ("substantial evidence supports the City's conclusion that the Project will not generate sufficient direct traffic to trigger an additional freeway impact analysis of the I-10 and 110 freeways and ramps under the MOU") and cumulative traffic on surface streets, but found that additional analysis was required with respect to the Project's cumulative impacts on the freeway system ("[t]he City must conduct a cumulative traffic impact analysis for the freeway system using probable future projects within the 2.0-mile radius of the Project") (August 9, 2018 Ruling on Writ). The Court did not find any other portions of the Project's June

2016 Final EIR ("2016 FEIR") to be deficient. Accordingly, this Cumulative Freeway Analysis provides the additional cumulative freeway traffic impact analysis required by the Court.

ANALYZED CALIFORNIA DEPARTMENT OF TRANSPORTATION ("CALTRANS") FACILITIES

The analyses conducted on Caltrans facilities included four freeway mainline segments (eastbound and westbound segments both east and west of Alameda Street), two signalized ramp intersections[1], and two off-ramp locations:

- The four freeway mainline segments on I-10 were analyzed using *Highway Capacity Manual, 6th Edition, A Guide for Multimodal Mobility Analysis* (Transportation Research Board, 2016) ("HCM") methodology to determine density, speed, and level of service ("LOS"), consistent with Caltrans District 7 requirements.

- Two intersections located at freeway ramps and under partial Caltrans jurisdiction were analyzed using HCM methodology to identify vehicle delay and LOS.

- Two freeway off-ramps were analyzed for ramp queue lengths using the Vistro software[2] to estimate queues.

Caltrans guidelines do not require the analysis of queues or capacity of freeway on-ramps because the performance of on-ramps is measured by the on-ramp/street intersection capacity calculations and the ramp meters on the ramp itself.

[1] The westbound I-10 off-ramp at Alameda Street is a single-lane ramp that widens to two lanes just prior to intersecting with E. 14th Street. The two lanes of the off-ramp free flow onto E. 14th Street approaching the traffic signal at Alameda Street. Westbound traffic on E. 14th Street faces a stop sign and, thus, traffic from the off-ramp has the right-of-way approaching Alameda Street. Field observations of the off-ramp operation indicate that the traffic signal at Alameda Street & E.14th Street creates queues that control the operation of the off-ramp. Therefore, this analysis treats the off-ramp as a signalized ramp with queues forming behind the Alameda Street & E. 14th Street traffic signal and extending onto the ramp.

[2] Vistro software is a publicly available software package that follows the procedures of the HCM to calculate the performance of mainline lanes, off-ramp queues, and intersection performance. Vistro software analysis has been accepted by Caltrans as an acceptable implementation of the HCM.

CUMULATIVE FREEWAY ANALYSIS RESULTS

This Cumulative Freeway Analysis considers the potential cumulative impacts from the Project and its 11 related projects (Table 6, Related Projects ["Related Projects"]). In accordance with Caltrans' desire to review *The 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS): Towards a Sustainable Future* (Southern California Association of Governments, April 2012) long-range planning horizon year of 2035, the Cumulative Freeway Analysis includes projections of Year 2035 conditions without and with Project traffic. The Cumulative Freeway Analysis isolates the potential impact of Project traffic on Year 2035 cumulative conditions along Interstate 10 at Alameda Street assuming background traffic growth occurring at an annual rate of 1% plus the traffic generated by the Related Projects.

MAINLINE SEGMENTS

Cumulative Freeway Mainline Segment Analysis – 2035

Traffic volumes were projected for Year 2035 to reflect a 21-year horizon. The existing traffic volumes were increased by both ambient growth (assumed to be 1% per year) and cumulative related project traffic.

The mainline freeway segment analysis shows that in Year 2035, four of the eight scenarios tested will operate over their capacity, even without the addition of Project traffic. Project traffic to be added to these freeway segments totals between six and 22 Project vehicles per hour as compared to the respective Year 2035 traffic levels between 8,900 and 14,500 vehicles per direction per hour. The change in operating density on the four measured segments is a maximum change of 0.1 vehicles per mile per lane. There is no change in operating speed as a result of adding Project traffic to the four freeway segments. These incremental changes are very small and would not be considered significant impacts.

Proportion of Growth Contribution by Project Traffic – Year 2035

The Project would add between six and 22 PCE trips per hour in one direction to any one of the four Caltrans mainline facility segments studied (eastbound and westbound segments both east and west of Alameda Street) during either the morning or afternoon peak hours. Because Caltrans does not provide specific incremental criteria by which to measure the significance of impacts to freeway mainline segments, there is not a standard to identify whether a specific facility would be significantly impacted.

While the Project would contribute to future 2035 cumulative traffic growth on the freeway system, the Project traffic represents 0.2% to 1.20% of the projected growth on the freeway segments between 2014 and 2035. The Project traffic averages 0.66% of the new traffic growth on the four freeway segments during the peak periods of the day. Project traffic growth at its highest segment would represent the addition of one car every 15 minutes per lane of freeway, which is a very small incremental increase and would not be considered significant.

INTERCHANGE INTERSECTIONS

The Caltrans analysis focuses on the two freeway ramp locations on the I-10/Alameda Street interchange. Caltrans does not have specific criteria to determine significance of incremental changes in intersection operations. The intersections under Caltrans jurisdiction were analyzed using the HCM methodology and implemented using the Vistro software. While Caltrans does not have a threshold for significant impacts at intersections, the Los Angeles Department of Transportation ("LADOT") threshold of significance is an increase in intersection delay of 6.0 seconds at LOS C and 4.0 seconds at LOS D[3].

Cumulative Intersection Analysis – Year 2035

The 2035 traffic volumes were developed by increasing the existing traffic volumes with both ambient growth (assumed to be 1% per year) and cumulative Related Project traffic. The

[3] *Traffic Study Policies and Procedures*, LADOT, August 2014, page 16.

cumulative analysis summarized the results of the signalized HCM analysis for Future without and with Project Scenarios for Year 2035. The ramp intersections are anticipated to operate at LOS D or better under all scenarios, regardless of the addition of Project traffic. With an operation of LOS C or D, the incremental increases in delay resulting from the addition of Project traffic would be in the 0.7 to 3.1 second range – below the LADOT threshold for significance, and, therefore, no cumulative significant intersection impact would result from Project traffic.

OFF-RAMP QUEUES

Two off-ramps from I-10 were analyzed to determine whether the lengths of the ramps were sufficient to accommodate vehicle queue lengths. The queue lengths were estimated using Vistro, which reports the 95th percentile queue length, in feet, for each approach lane on the off-ramp.

The assessment of the off-ramps included a review of the vehicle queue length as compared to the total available queuing capacity of the ramp to determine whether the vehicle queue would extend beyond the length of the ramp onto the mainline.

Cumulative Off-Ramp Queue Analysis – Year 2035

The Year 2035 traffic volumes were developed by increasing the existing traffic volumes by both ambient growth (assumed to be 1% per year) and cumulative related project traffic. The analysis summarized the results of the queuing analysis for Future without and with Project Scenarios for Year 2035.

The queues at the two off-ramps do not extend beyond the available capacity under Future Scenario (Year 2035), without and with the addition of Project traffic. The addition of Project traffic does not substantially increase the off-ramp queue under any of the scenarios tested above (less than one vehicle length during any of the scenarios tested). Therefore, the addition of Project traffic will not cause a significant impact at either ramp location.

ADDITIONAL ALTERNATIVE CUMULATIVE ANALYSIS

In addition, for informational purposes only, an additional alternative cumulative freeway analysis was conducted to consider the potential cumulative impacts from the Project and its Related Projects and another project ("SOLA Village") and its 82 related projects. This additional analysis finds results very similar to the results above with the Project's Related Projects.

Alternative Freeway Cumulative Mainline Analysis –Year 2035

The additional analysis shows that long-range cumulative conditions on the I-10 freeway segments will exceed their capacity in Year 2035. Project traffic increases in the I-10 sections immediately east and west of Alameda Street are between six and 22 vehicles per direction per hour, compared to projected future traffic levels between 10,900 and 16,300 vehicles per direction per hour.

Because of the larger growth in background traffic caused by the additional SOLA Village related projects, the proportion of growth associated with Project traffic is less than with the Related Projects. Again, the proportion of Project traffic makes up less than 1% of the total growth (0.34%). This level of Project traffic would not cause a direct significant impact on the mainline freeway lanes, but it would contribute traffic to long-range cumulative conditions in Year 2035. The Project would be responsible for 0.34% of the growth occurring between now and Year 2035.

Alternative Cumulative Intersection Analysis – Year 2035

The LOS of the two intersections serving the freeway ramps at I-10/Alameda Street still operate at an acceptable LOS even with the addition of Project traffic. The addition of Project traffic to Year 2035 cumulative conditions would result in an increase in intersection delay of 0.7 to 2.2 seconds. While Caltrans does not have a threshold for significant impacts at intersections, LADOT's threshold of significance is an increase in intersection delay of 6.0 seconds at LOS C and 4.0 seconds at LOS D[4].

[4] *Traffic Study Policies and Procedures,* LADOT, August 2014, page 16.

The two study interchange intersections would operate at LOS C or D with or without the Project in place. Neither intersection would experience an increase in delay approaching the LADOT thresholds and, therefore, no significant impact is expected.

Alternative Cumulative Off-Ramp Queue Analysis – Year 2035

The Year 2035 traffic volumes were developed by increasing the existing traffic volumes by both ambient growth (assumed to be 1% per year) and cumulative related project traffic. The projected queues at the two off-ramps do not extend beyond the available capacity under Future Scenarios (Year 2035), without and with the addition of Project traffic. The addition of Project traffic does not substantially increase the off-ramp queue under any of the scenarios tested (less than one vehicle length during any of the scenarios tested). Therefore, the addition of Project traffic will not cause a significant impact at either ramp location.

SUMMARY

Under long-range cumulative conditions (Year 2035), the addition of Project traffic is not large enough to create a substantial impact on the mainline freeway lanes or the performance of the ramp intersections with the City of Los Angeles street system. Project traffic does not add enough traffic to result in off-ramp queues backing out onto the freeway mainlines.

Chapter 1
Introduction

This Cumulative Analysis of Freeway Facilities ("Cumulative Freeway Analysis") has been prepared to provide additional cumulative freeway analysis required by the Peremptory Writ of Mandate ("Writ"), issued on January 8, 2019 in *Ponce, et al. v. City of Los Angeles, et. al.*, Los Angeles Superior Court Case No. BS 169426 ("*Ponce*") with respect to the Alameda Industrial Park Warehouse Project ("Project") located at 4051 South Alameda Street in Los Angeles ("Project Site"). This Cumulative Freeway Analysis supplements *Addendum to Traffic Impact Study, 4051 S. Alameda Street Alameda Industrial Park Warehouse, Los Angeles, California* (Traffic Design, Inc., October 3, 2014) ("2014 Addendum").

In *Ponce*, the Court, the Hon. James C. Chalfant presiding, upheld the 2014 Addendum analysis with respect to the Project's direct traffic ("substantial evidence supports the City's conclusion that the Project will not generate sufficient direct traffic to trigger an additional freeway impact analysis of the I-10 and 110 freeways and ramps under the MOU") and cumulative traffic on surface streets, but found that additional analysis was required with respect to the Project's cumulative traffic impacts on the freeway system ("[t]he City must conduct a cumulative traffic impact analysis for the freeway system using probable future projects within the two-mile radius of the Project") (August 9, 2018 Ruling on Writ). The Court did not find any other portions of the Project's June 2016 Final EIR ("2016 FEIR") to be deficient. Accordingly, this Cumulative Freeway Analysis provides the additional cumulative freeway traffic impact analysis required by the Court.

This Cumulative Freeway Analysis considers the potential cumulative impacts from the Project and its 11 related projects (Table 6, Related Projects ["Related Projects"]). The Cumulative Freeway Analysis isolates the potential impact of Project traffic on Year 2035 cumulative conditions along Interstate 10 at Alameda Street assuming background traffic growth occurring at an annual rate of 1% plus the traffic generated by the Related Projects. The analysis shows that Project traffic does not add enough traffic to the mainline freeway traffic levels to substantially change the operating density of the freeway or the operating speed of the facility. The proportion of growth associated with Project traffic is less than 1% of the total growth (0.66%). The level of

service (“LOS”) of the two intersections serving the freeway ramps at I-10/Alameda Street do not degrade as a result of Project traffic, with both intersections still operating at an acceptable LOS. Additionally, Project traffic does not add enough traffic to the two off-ramps at I-10/Alameda Street to cause the off-ramp queues to back up onto the freeway mainline lanes.

In addition, for informational purposes only, an additional alternative cumulative freeway analysis was conducted to consider the potential cumulative impacts from the Project and its Related Projects, and another project (“SOLA Village”) and its 82 related projects. This additional analysis, which is provided in Appendix A, finds results very similar to the results above with the Related Projects. The additional analysis shows that long-range cumulative conditions on the I-10 freeway segment will exceed its capacity in Year 2035. Project traffic increases in the I-10 sections immediately east and west of Alameda Street are between six and 22 vehicles per direction per hour, compared to projected future traffic levels between 10,900 and 16,300 vehicles per direction per hour. Because of the larger growth in background traffic caused by the additional SOLA Village related projects, the proportion of growth associated with Project traffic is less than with the Related Projects. Again, the proportion of Project traffic makes up less than 1% of the total growth (0.34%). The LOS of the two intersections serving the freeway ramps at I-10/Alameda Street still operate at an acceptable LOS even with the addition of Project traffic. Project traffic does not cause queues on the two off-ramps at I-10/Alameda Street that would back up onto the freeway mainline lanes.

The 2014 Addendum traffic analysis was prepared pursuant to the methodology, assumptions, and analysis established by the Los Angeles Department of Transportation (“LADOT”). The 2014 Addendum was reviewed and approved by LADOT in the most recent assessment letters provided in Appendix B. The California Department of Transportation (“Caltrans”) comment letters received during the environmental review process in connection with the 2014 Addendum are provided in Appendix C. Subsequent to the issuance of the Writ, the City of Los Angeles (“City”) and Gibson Transportation Consulting, Inc. have worked with Caltrans to confirm the adequacy of this Cumulative Freeway Analysis.

PROJECT BACKGROUND

The Project proposes the construction of a warehousing and manufacturing facility to include up to 466,120 square feet ("sf") of warehousing space, including ancillary office uses, and up to 14,000 sf of manufacturing space in four buildings. The Project Site, which is currently vacant and free of any structures, is bounded by Martin Luther King, Jr. Boulevard to the north, Alameda Street to the east, 41st Street to the south, and Long Beach Avenue to the west. The Project Site is located approximately 1.2 miles south of I-10, approximately 2.5 miles east of I-110, and approximately 3.8 miles west of I-710. Project traffic is anticipated to generate the highest traffic levels along I-10, and thus, the analysis below focuses on Project trips along I-10. Access to the Project is provided via four driveways along Martin Luther King, Jr. Boulevard and four driveways along 41st Street.

Trip Generation

Trip generation for the Project as reported in the 2014 Addendum was estimated based on *Trip Generation, 9th Edition* (Institute of Transportation Engineers ["ITE"], 2012). In addition, appropriate trip reductions to account for transit usage, as allowed by LADOT, and conversion of truck trips to passenger car equivalent ("PCE") trips were applied to the ITE base trip rates and detailed in the 2014 Addendum. Per the 2014 Addendum and as shown in Table 1, the Project is anticipated to generate 1,917 daily PCE trips, including 167 PCE trips during the morning peak hour (133 PCE inbound and 34 PCE outbound trips) and 179 PCE trips during the afternoon peak hour (46 PCE inbound and 133 PCE outbound trips). Distribution of Project traffic to the local and regional networks used for this analysis is consistent with the 2014 Addendum.

RELATED PROJECTS

This Cumulative Freeway Analysis considers the potential cumulative impacts from the Project and the Related Projects listed in Project Draft EIR ("DEIR") at Table II.B-1, Related Projects (Page II-4 of the DEIR). These Related Projects, which are also shown in Table 6, Related Projects, were identified in consultation with LADOT and the Department of City Planning pursuant to *Traffic Study Policies and Procedures* (LADOT, August 2014) and *L.A. CEQA*

Thresholds Guide: Your Resource for Preparing CEQA Analyses in Los Angeles (City of Los Angeles, 2006).

In addition, set forth in Appendix A is an additional alternative cumulative freeway analysis, for informational purposes only, that conservatively takes into account traffic associated with the Project and its Related Projects, and the SOLA Village project ("SOLA Village") and the 82 related projects identified in the SOLA Village EIR. The list of SOLA Village related projects is contained within Appendix A in Table A-4.

Chapter 2
Cumulative Freeway Analysis

CALTRANS METHODOLOGY

To provide further information to the decision makers and Caltrans, a supplemental cumulative freeway analysis was conducted using *Highway Capacity Manual, 6th Edition, A Guide for Multimodal Mobility Analysis* (Transportation Research Board, 2016) ("HCM") methodology. The HCM methodology was used to determine the LOS for the freeway mainline facilities and is the underlying methodology in the Vistro software used to determine the vehicle delay and LOS at each ramp intersection. The analysis results are summarized below, with supporting data provided in Appendix D.

ANALYZED CALTRANS FACILITIES

As shown in Figure 1 and Table 2, the analyses conducted on Caltrans facilities included four freeway mainline segments (eastbound and westbound segments both east and west of Alameda Street), two signalized ramp intersections[5], and two off-ramp locations:

- The four freeway mainline segments on I-10 were analyzed using HCM methodology to determine density, speed, and LOS. The LOS definitions for freeway mainline segments based on HCM methodology are presented in Table 3.

[5] The westbound I-10 off-ramp at Alameda Street is a single-lane ramp that widens to two lanes just prior to intersecting with E. 14th Street. The two lanes of the off-ramp free flow onto E. 14th Street approaching the traffic signal at Alameda Street. Westbound traffic on E 14th Street faces a stop sign and, thus, traffic from the off-ramp has the right-of-way approaching Alameda Street. Field observations of the off-ramp operation indicate that the traffic signal at Alameda Street & E. 14th Street creates queues that control the operation of the off-ramp. Therefore, this analysis treats the off ramp as a signalized ramp with queues forming behind the Alameda Street & E. 14th Street traffic signal and extending onto the ramp.

- Two signalized intersections located at freeway ramps and under partial Caltrans jurisdiction were analyzed using HCM methodology to identify vehicle delay and LOS.

- Two freeway off-ramps were analyzed for ramp queue lengths using the Vistro software to estimate queues[6].

Caltrans guidelines do not require the analysis of queues or capacity of freeway on-ramps because the performance of on-ramps is measured by the on-ramp/street intersection capacity calculations and the ramp meters on the ramp itself.

Detailed LOS worksheets for each type of analysis are included in Appendix D.

CUMULATIVE ANALYSIS OF FREEWAY MAINLINE SEGMENTS

This analysis reviewed the potential Project-generated traffic impacts on Caltrans facilities as compared to "Existing Scenario" (Year 2014). In addition, in accordance with Caltrans' desire to review *The 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS): Towards a Sustainable Future* (Southern California Association of Governments, April 2012)[7] long-range planning horizon year of 2035, the cumulative analysis of freeway facilities herein also includes projections to Year 2035 conditions with and without Project traffic.

Freeway Mainline Segment Analysis – 2014

Four freeway mainline segments on I-10 were analyzed using the HCM methodology – eastbound and westbound travel lanes both east and west of Alameda Street. Freeway volume data from *2014 Traffic Volumes on California State Highways* (Caltrans, 2015) was used to reflect Existing Scenario (Year 2014) and is summarized in the first two columns of Table 4.

[6] Vistro software is a publicly available software package that follows the procedures of the HCM to calculate the performance of mainline lanes, off-ramp queues, and intersection performance. Vistro software analysis has been accepted by Caltrans as an acceptable implementation of the HCM.

[7] References to *The 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS): Towards a Sustainable Future* were used to be consistent with the prior analysis years.

Table 5 summarizes the results of the HCM analysis for Existing Scenario and Existing with Project Scenarios. Under Year 2014 scenarios, two westbound freeway segments are operating over their capacity. One of the remaining segments studied would experience a minimal decrease of 0.1 miles per hour operating speed during the afternoon peak hour, and operating density for all remaining segments would increase by a maximum of only 0.2 vehicles per mile per hour . As shown in Table 5, Project traffic either does not affect existing operations or results in very small incremental increases and, thus, addition of Project traffic on the mainline facilities would not be considered significant.

Cumulative Freeway Mainline Segment Analysis – 2035

Traffic volumes were projected for Year 2035 to reflect a 21-year horizon and are summarized in the last two columns of Table 4. The existing traffic volumes were increased by both ambient growth (assumed to be 1% per year) and cumulative Related Project traffic as shown in Table 6. *2010 Los Angeles County Congestion Management Program* (Los Angeles County Metropolitan Transportation Authority, 2010) ("CMP") provides general growth factors based on regional modeling. As shown in Exhibit D-1 of the CMP, the Project Site is located in Regional Statistical Area 11 (Vernon), which is estimated to experience a total regional growth in traffic of 18.2% between the years of 2010 and 2035. This equates to an ambient growth factor of approximately 0.73% per year. Thus, an ambient growth factor of 1% per year is conservative and was used to estimate future traffic volumes over the 21-year period.

Table 6 lists the Related Projects identified in the DEIR.[8] Table 7 summarizes the results of the HCM analysis for Year 2035 Future without Project Scenario and Future with Project Scenario.

The mainline freeway segment analysis shows that in Year 2035, four of the eight scenarios tested will operate over their capacity, even without the addition of Project traffic. Table 4 shows that the Project traffic to be added to these freeway segments totals between six and 22 Project vehicles per hour as compared to Year 2035 traffic levels between 10,900 and 16,300 vehicles per direction per hour. Table 7 shows that the change in operating density on the four measured segments is a maximum change of 0.1 vehicles per mile per hour. There is no change in operating

[8] For informational purposes only, an additional cumulative freeway analysis was conducted with the 82 related projects from the SOLA Village EIR plus the SOLA Village Project and is provided in Appendix D.

speed as a result of adding Project traffic to the four freeway segments. Again, these incremental changes are very small and, thus, addition of Project traffic on the mainline facilities would not be considered significant.

Proportion of Growth Contribution by Project Traffic – Year 2035

As shown in Table 8, the Project would add between six and 22 PCE trips per hour in one direction to any one of the four Caltrans mainline facility segments studied (eastbound and westbound segments both east and west of Alameda Street) during either the morning or afternoon peak hours. Because Caltrans does not provide specific incremental criteria by which to measure the significance of impacts to freeway mainline segments, there is not a standard to identify whether a specific facility would be significantly impacted.

While the Project would contribute to future 2035 cumulative traffic growth on the freeway system, the Project traffic represents 0.2% to 1.20% of the projected growth on the freeway segments between 2014 and 2035. The Project traffic averages 0.66% of the new traffic growth on the four freeway segments during the peak periods of the day. Project traffic growth at its highest segment would represent the addition of one car every 15 minutes per lane of freeway, which is a very small incremental increase which would not be considered significant.

CUMULATIVE ANALYSIS OF INTERCHANGE INTERSECTIONS

As shown in Table 2, this Caltrans analysis focuses on the two signalized freeway ramp intersections on the I-10/Alameda Street interchange. Caltrans does not have specific criteria to determine significance of incremental changes in intersection operations. The intersections under Caltrans jurisdiction, as listed in Table 2, were analyzed using the HCM methodology and implemented using the Vistro software. Table 9 summarizes the LOS definitions for signalized intersections.

Intersection Analysis – Year 2014

The analysis of Year 2014 scenarios was conducted using the traffic volumes for Year 2014 utilized for the Existing Scenario analysis as presented in the 2014 Addendum. Table 10 summarizes the results of the signalized HCM analysis for Existing and Existing with Project Scenarios for Year 2014.

The addition of Project traffic to Existing 2014 Scenario would result in an increase in intersection delay of 0.1 to 0.9 seconds. While Caltrans does not have a threshold for significant impacts at intersections, LADOT's threshold of significance is an increase in intersection delay of 6.0 seconds at LOS C and 4.0 seconds at LOS D[9].

Table 10 shows that the two study interchange intersections would operate at LOS B or C with or without the Project in place. Neither intersection would experience an increase in delay approaching the LADOT thresholds and, therefore, no significant impact would result.

Cumulative Intersection Analysis – Year 2035

The 2035 traffic volumes were developed by increasing the existing traffic volumes with both ambient growth (assumed to be 1% per year) and cumulative related project traffic. Table 11 summarizes the results of the signalized HCM analysis for Future without and with Project Scenarios for Year 2035. The ramp intersections are anticipated to operate at LOS D or better under all scenarios, regardless of the addition of Project traffic. With an operation of LOS C or D, the incremental increases in delay resulting from the addition of Project traffic would be in the 0.7 to 3.1 second range – below the LADOT threshold for significance and, therefore, no cumulative significant intersection impact would result.

[9] *Traffic Study Policies and Procedures*, Los Angeles Department of Transportation, August 2014, page 16.

CUMULATIVE ANALYSIS OF OFF-RAMP QUEUES

Two off-ramps from I-10 were analyzed to determine whether the lengths of the ramps were sufficient to accommodate vehicle queue lengths. The queue lengths were estimated using Vistro, which reports the 95th percentile queue length, in feet, for each approach lane on the off-ramp.

The assessment of the off-ramps included a review of the vehicle queue length as compared to the total available queuing capacity of the ramp to determine whether the vehicle queue would extend beyond the length of the ramp onto the mainline. To this end, the queuing analysis looks at two separate components of ramp capacity: the first is the length of each approach lane to the intersection, and the second looks at the remaining length of the ramp, behind any approach lane delineation lines, to the gore point where the ramp diverges from the freeway mainline. The queue may exceed the striped length of a given approach lane, as long as there is sufficient additional queuing capacity on the ramp so that the queue will not spill over onto the mainline.

Off-Ramp Queue Analysis – Year 2014

The analysis of Year 2014 scenarios was conducted using traffic count data utilized for the Existing Scenario analysis per the 2014 Addendum. Table 12 summarizes the results of the queuing analysis for Existing Scenario and Existing with Project Scenario for Year 2014.

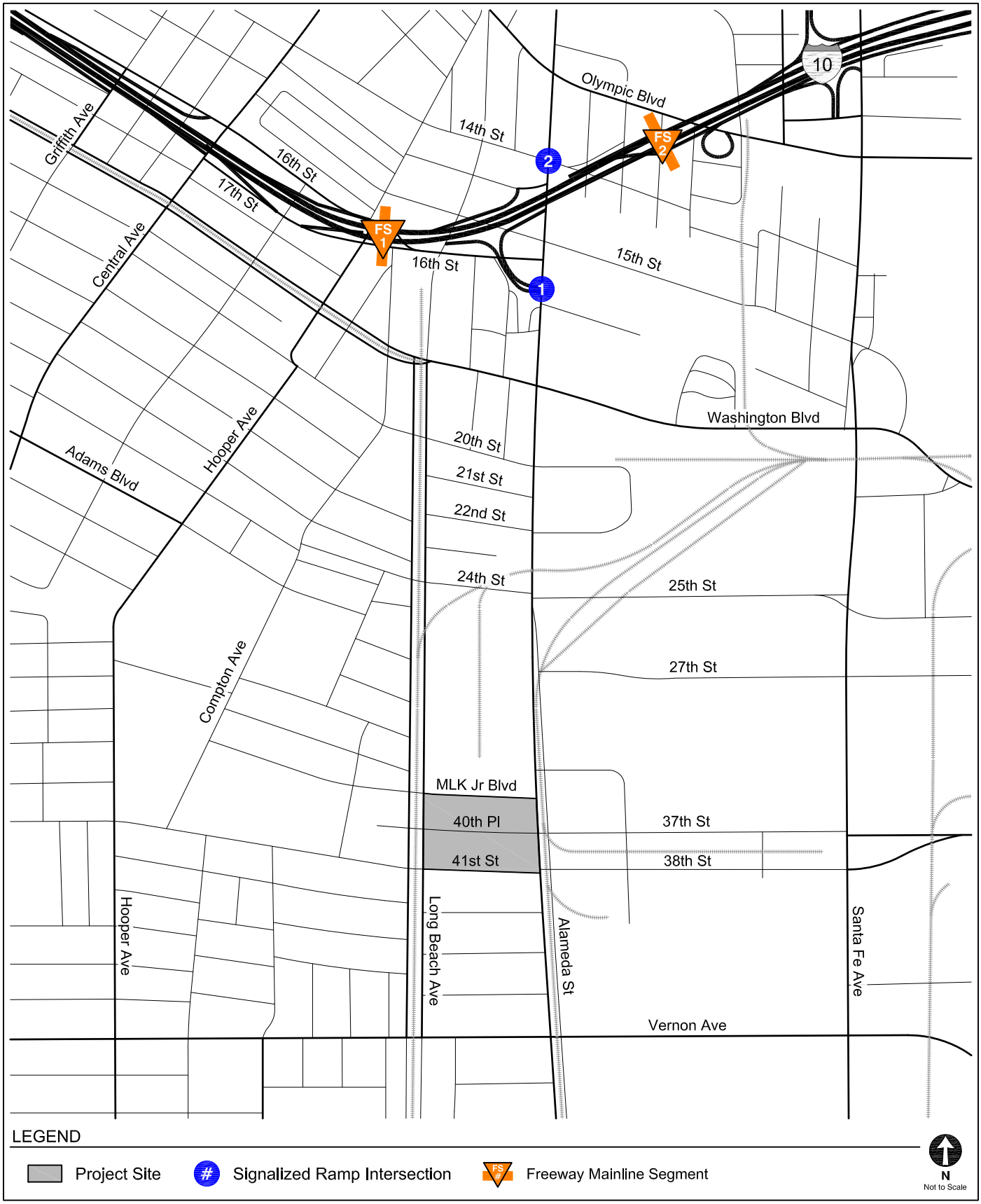
The Year 2014 analysis shows that the Existing Scenario without the Project provides sufficient queue length on the off-ramps that neither the morning or the afternoon peak hours at either ramp would experience a condition whereby the queue extended onto the mainline freeway lanes. The same condition exists for the Year 2014 scenario with Project Traffic. The addition of Project traffic would not cause either of the off-ramps to back up onto the mainline freeway lanes. Therefore, the addition of Project traffic will not cause a significant impact at either ramp location.

Cumulative Off-Ramp Queue Analysis – Year 2035

The Year 2035 traffic volumes were developed by increasing the existing traffic volumes by both ambient growth (assumed to be 1% per year) and cumulative Related Project traffic. Table 13

summarizes the results of the queuing analysis for Future without and with Project Scenarios for Year 2035.

The queues at the two off-ramps do not extend beyond the available capacity under Future Scenarios (Year 2035), without and with the addition of Project traffic. The addition of Project traffic does not substantially increase the off-ramp queue under any of the scenarios tested above (less than one vehicle length during any of the scenarios tested). Therefore, the addition of Project traffic will not cause a significant impact at either ramp location.



PROJECT STUDY AREA

FIGURE 1

TABLE 1
PROJECT TRIP GENERATION ESTIMATES

Land Use	ITE Land Use	Rate	Daily	A.M. Peak Hour			P.M. Peak Hour		
				In	Out	Total	In	Out	Total
TRIP GENERATION RATES [a]									
Manufacturing	140	per ksf	3.82	78%	22%	0.73	36%	64%	0.73
Warehousing	150	per ksf	3.56	79%	21%	0.30	25%	75%	0.32
TRIP GENERATION ESTIMATES									
Proposed Project									
Manufacturing	140	14.000 ksf	53	8	2	10	4	6	10
Warehousing	150	466.120 ksf	1,659	111	29	140	37	112	149
TOTAL - PROPOSED			**1,712**	**119**	**31**	**150**	**41**	**118**	**159**
Trucks for Warehousing and Manufacturing: 20% of vehicular trips per ITE's "Trip Generation, 9th Edition"			*342*	*24*	*6*	*30*	*8*	*24*	*32*
Trucks in Passenger Car Equivalent PCE (1 Truck = 2 PCE)			684	48	12	60	16	48	64
Other Vehicles			1,370	95	25	120	33	94	127
Less 10% Due to Local Employement/Transit Use			*(137)*	*(10)*	*(3)*	*(13)*	*(3)*	*(9)*	*(12)*
TOTAL - NET NEW PROJECT TRIPS			**1,917**	**133**	**34**	**167**	**46**	**133**	**179**

Notes:
ksf: 1,000 square feet
[a] Trip generation rates are from *Trip Generation, 9th Edition* (Institute of Transportation Engineers, 2012).

TABLE 2
ANALYZED CALTRANS FACILITIES

ID	Location
Freeway Mainline Segments	
FS-1a	I-10 between San Pedro Street/Central Avenue & Alameda Street -- Eastbound
FS-1b	I-10 between San Pedro Street/Central Avenue & Alameda Street -- Westbound
FS-2a	I-10 between Alameda Street & Santa Fe Avenue -- Eastbound
FS-2b	I-10 between Alameda Street & Santa Fe Avenue -- Westbound
Signalized Ramp Intersections	
S-1.	Alameda Street & I-10 Eastbound Ramps
S-2.	Alameda Street & 14th Street / I-10 Westbound Off-Ramp
Off-ramp Queues	
Q-1.	Alameda Street & I-10 Eastbound Off-Ramp
Q-2.	Alameda Street & I-10 Westbound Off-Ramp

TABLE 3
FREEWAY SEGMENT LEVEL OF SERVICE

Level of Service	**Description**	**Density** [a]
A	Free-flow speeds prevail. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream.	≤ 11
B	Free-flow speeds are maintained. The ability to maneuver with the traffic stream is only slightly restricted.	> 11 and ≤ 18
C	Flow with speeds at or near free-flow speeds. Freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver.	> 18 and ≤ 26
D	Speeds decline slightly with increasing flows. Freedom to maneuver with the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort.	> 26 and ≤ 35
E	Operation at capacity. There are virtually no usable gaps within the traffic stream, leaving little room to maneuver. Any disruption can be expected to produce a breakdown with queuing.	> 35 and ≤ 45
F	Represents a breakdown in flow and oversaturated conditions.	> 45

Notes

Source: *Highway Capacity Manual, 6th Edition, A Guide for Multimodal Mobility Analysis* (Transportation Research Board, 2016) (HCM methodology) and Caltrans.

[a] Density is defined in vehicles per mile per lane and describes the proximity to other vehicles and is related to the freedom to maneuver within the traffic stream (HCM methodology).

TABLE 4
FREEWAY MAINLINE SEGMENT TRAFFIC VOLUMES

ID	Freeway Mainline Segment	Peak Hour	Direction	Vehicles per Hour (VPH)				
				Existing Scenario (Year 2014) [a]	Existing with Project Scenario (Year 2014)	Future without Project Scenario (Year 2035)	Future with Project Scenario (Year 2035)	Project Only Volumes
FS-1.	I-10 between San Pedro Street/Central Avenue & Alameda Street	AM Peak Hour	EB	7,636	7,657	9,431	9,452	21
			WB	11,472	11,478	14,151	14,157	6
		PM Peak Hour	EB	9,895	9,903	12,199	12,207	8
			WB	7,246	7,267	8,935	8,956	21
FS-2.	I-10 between Alameda Street & Santa Fe Avenue	AM Peak Hour	EB	7,826	7,833	9,656	9,663	7
			WB	11,758	11,778	14,501	14,521	20
		PM Peak Hour	EB	10,142	10,164	12,503	12,525	22
			WB	7,426	7,433	9,156	9,163	7

Notes
[a] Traffic volume data from traffic count data from *2014 Traffic Volumes on California State Highways* (Caltrans, 2015) were used to be consistent with the analysis years in 2014 Addendum.

TABLE 5
EXISTING OPERATING SCENARIOS (YEAR 2014)
FREEWAY SEGMENT LEVEL OF SERVICE EVALUATION

ID	Freeway Segment	Peak Hour	Direction	Existing Scenario			Existing with Project Scenario			
				Speed [a][b]	**Density** [b][c]	**LOS**	**Speed** [a][b]	**Density** [b][c]	**LOS**	**Impact**
FS-1.	I-10 between San Pedro Street/Central Avenue & Alameda Street	AM	EB	52.4	31.8	D	52.4	31.9	D	NO
			WB	Overflow	Overflow	F	Overflow	Overflow	F	NO
		PM	EB	50.5	42.7	E	50.5	42.8	E	NO
			WB	52.4	30.2	D	52.4	30.3	D	NO
FS-2.	I-10 between Alameda Street & Santa Fe Avenue	AM	EB	52.4	32.6	D	52.4	32.6	D	NO
			WB	Overflow	Overflow	F	Overflow	Overflow	F	NO
		PM	EB	49.6	44.6	E	49.5	44.8	E	NO
			WB	52.4	30.9	D	52.4	30.9	D	NO

Notes

Overflow: Traffic demand exceeds the available capacity of the freeway mainline segment.

[a] Mean speed measured in miles per hour (mph).

[b] Methodology from *Highway Capacity Manual, 6th Edition, A Guide for Multimodal Mobility Analysis* (Transportation Research Board, 2016) (HCM methodology).

[c] Measured in vehicles per mile per lane (v/m/l) for freeways with a free-flow speed of 58.2 mph. Free-flow speed, as defined in HCM methodology, is the theoretical speed when the density and flow rate of the freeway mainline segment are both zero.

TABLE 6
RELATED PROJECTS [a]

No.	Project	Address	Use	Trip Generation						
				Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
1.	Affordable Housing and Comm/Retail	937 E. Adams Boulevard	80 apartment units and ground floor retail	1,298	65	91	156	51	42	93
2.	Mini-shopping Center	4051 S. Avalon Boulevard	23,787 sf mini-shopping center	1,056	78	85	163	28	36	64
3.	Mixed-use Apartments and Retail	220 E. Washington Boulevard	78 apartment units and 5,600 sf retail	762	26	48	74	36	24	60
4.	Warehouse, Office, Light Industrial	2455 E. Washington Boulevard	446,230 sf warehouse, office, light industrial	1,906	127	34	161	43	129	172
5.	Buying and Selling and Storage Facility	1571 E. Adams Boulevard	5,224 sf warehousing and auto transmission and engine sales	22	1	1	2	1	2	3
6.	Conversion of Church into a Coin Laundry	5300 S. Central Avenue	6,942 sf conversion of church to coin laundry	308	23	25	48	8	11	19
7.	Buy back Collection Recycling Center	1742 E. 14th Street	6,712 sf collection recycling center	298	22	24	46	8	10	18
8.	Church Expansion and Remodel	1308 E. 46th Street	3,484 sf church expansion and remodel	32	1	1	2	1	1	2
9.	2-lot Industrial Condominiums	2900 E. Lugo Street	8 condominium units	292	4	18	22	17	9	26
10.	Converting Manufac. to Indoor Swap Meet	3110 E. 12th Street	39,400 sf retail	1,748	129	140	269	47	60	107
11.	Unmanned Wireless Telecom Facility	5600 S. Central Avenue	Unmanned wireless telecommunications facility [b]	--	--	--	--	--	--	--

Notes

[a] Related project list per 2016 FEIR

[b] Non-traffic generator

TABLE 7
FUTURE OPERATING SCENARIOS (YEAR 2035)
FREEWAY SEGMENT LEVEL OF SERVICE EVALUATION

ID	Freeway Segment	Peak Hour	Direction	Future without Project Scenario			Future with Project Scenario			
				Speed [a][b]	**Density** [b][c]	**LOS**	**Speed** [a][b]	**Density** [b][c]	**LOS**	**Impact**
FS-1.	I-10 between San Pedro Street/Central Avenue & Alameda Street	AM	EB	51.7	39.8	E	51.7	39.9	E	NO
			WB	Overflow	Overflow	F	Overflow	Overflow	F	NO
		PM	EB	Overflow	Overflow	F	Overflow	Overflow	F	NO
			WB	52.3	37.3	E	52.3	37.4	E	NO
FS-2.	I-10 between Alameda Street & Santa Fe Avenue	AM	EB	51.2	41.1	E	51.2	41.2	E	NO
			WB	Overflow	Overflow	F	Overflow	Overflow	F	NO
		PM	EB	Overflow	Overflow	F	Overflow	Overflow	F	NO
			WB	52.1	38.3	E	52.1	38.4	E	NO

Notes

Overflow: Traffic demand exceeds the available capacity of the freeway mainline segment.

[a] Mean speed measured in miles per hour (mph).

[b] Methodology from *Highway Capacity Manual, 6th Edition, A Guide for Multimodal Mobility Analysis* (Transportation Research Board, 2016) (HCM methodology).

[c] Measured in vehicles per mile per lane (v/m/l) for freeways with a free-flow speed of 58.2 mph. Free-flow speed, as defined in HCM methodology, is the theoretical speed when the density and flow rate of the freeway mainline segment are both zero.

TABLE 8
PROPORTION OF PROJECTED FUTURE TRAFFIC
FUTURE YEAR 2035 SCENARIOS

ID	Freeway Mainline Segment	Peak Hour	Direction	Vehicles per Hour (VPH)				Proportion of Project-Related Traffic
				Existing	Background Growth (Ambient Growth + Related Project Traffic)	Project	Total Growth	
FS-1.	I-10 between San Pedro Street/Central Avenue & Alameda Street	AM Peak Hour	EB	7,636	1,795	21	1,816	1.20%
			WB	11,472	2,679	6	2,685	0.20%
		PM Peak Hour	EB	9,895	2,304	8	2,312	0.30%
			WB	7,246	1,689	21	1,710	1.20%
FS-2.	I-10 between Alameda Street & Santa Fe Avenue	AM Peak Hour	EB	7,826	1,830	7	1,837	0.40%
			WB	11,758	2,743	20	2,763	0.70%
		PM Peak Hour	EB	10,142	2,361	22	2,383	0.90%
			WB	7,426	1,730	7	1,737	0.40%
Average Proportion of Project-Related Traffic to Mainline Segments								**0.66%**

TABLE 9
INTERSECTION LEVEL OF SERVICE

Level of Service	Description	Delay [a]
		Signalized Intersections
A	EXCELLENT. No vehicle waits longer than one red light and no approach phase is fully used.	≤ 10
B	VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.	> 10 and ≤ 20
C	GOOD. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.	> 20 and ≤ 35
D	FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.	> 35 and ≤ 55
E	POOR. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.	> 55 and ≤ 80
F	FAILURE. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Tremendous delays with continuously increasing queue lengths.	> 80

Notes

Source: *Highway Capacity Manual, 6th Edition, A Guide for Multimodal Mobility Analysis* (Transportation *Research Board, 2016).*

[a] Measured in seconds.

TABLE 10
EXISTING WITH PROJECT SCENARIOS (YEAR 2014)
INTERSECTION PEAK HOUR LEVELS OF SERVICE

No.	Intersection	Peak Hour	Existing Scenario		Existing with Project Scenario		
			Delay	LOS	Delay	LOS	Impact
S-1.	Alameda Street & I-10 Eastbound Ramps	A.M. P.M.	20.1 24.8	C C	21.0 25.7	C C	NO NO
S-2.	Alameda Street & 14th Street / I-10 Westbound Off-Ramp	A.M. P.M.	18.1 22.5	B C	18.4 22.6	B C	NO NO

Notes

Delay is measured in seconds per vehicle

LOS = Level of service

Results per Vistro (HCM methodology).

TABLE 11
FUTURE WITH PROJECT SCENARIOS (YEAR 2035)
INTERSECTION PEAK HOUR LEVELS OF SERVICE

No.	Intersection	Peak Hour	Future without Project Scenario		Future with Project Scenario		
			Delay	LOS	Delay	LOS	Impact
S-1.	Alameda Street & I-10 Eastbound Ramps	A.M. P.M.	27.0 40.2	C D	28.0 43.3	C D	NO NO
S-2.	Alameda Street & 14th Street / I-10 Westbound Off-Ramp	A.M. P.M.	31.0 46.5	C D	31.7 47.4	C D	NO NO

Notes

Delay is measured in seconds per vehicle

LOS = Level of service

Results per Vistro (HCM methodology).

TABLE 12
FREEWAY OFF-RAMP QUEUE EVALUATION
EXISTING OPERATING SCENARIOS (YEAR 2014)

ID	Freeway Off-ramp	Ramp and Lane Description	Vehicle Storage Capacity [a]	Existing Scenario				Existing with Project Scenario			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Vehicle Queue Length [b]	Exceeds Capacity?	Vehicle Queue Length [b]	Exceeds Capacity?	Vehicle Queue Length [b]	Exceeds Capacity?	Vehicle Queue Length [b]	Exceeds Capacity?
Q-1.	Alameda Street &	I-10 Eastbound Off-Ramp									
	I-10 Eastbound Ramps	Left	255	255		255		255		255	
		Right	255	255		255		255		255	
		Ramp	870	130	NO	321	NO	142	NO	309	NO
Q-2.	Alameda Street &	I-10 Westbound Off-Ramp									
	14th Street / I-10 Westbound Off-Ramp	Left	220	143		174		148		178	
		Shared Left/Through	350	144		172		149		175	
		Right	350	21		40		21		40	
		Ramp	890	0	NO	0	NO	0	NO	0	NO

Notes

[a] Expressed in feet.

[b] 95th Percentile queue results per Vistro (HCM Methodology).

TABLE 13
FREEWAY OFF-RAMP QUEUE EVALUATION
FUTURE OPERATING SCENARIOS (YEAR 2035)

ID	Freeway Off-ramp	Ramp and Lane Description	Vehicle Storage Capacity [a]	Future without Project Scenario				Future with Project Scenario			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Vehicle Queue Length [b]	Exceeds Capacity?	Vehicle Queue Length [b]	Exceeds Capacity?	Vehicle Queue Length [b]	Exceeds Capacity?	Vehicle Queue Length [b]	Exceeds Capacity?
Q-1.	Alameda Street &	I-10 Eastbound Off-Ramp									
	I-10 Eastbound Ramps	Left	255	255		255		255		255	
		Right	255	255		255		255		255	
		Ramp	870	349	NO	460	NO	379	NO	460	NO
Q-2.	Alameda Street &	I-10 Westbound Off-Ramp									
	14th Street / I-10 Westbound Off-Ramp	Left	220	200		220		218		220	
		Shared Left/Through	350	195		342		210		350	
		Right	350	25		50		25		50	
		Ramp	890	0	NO	152	NO	0	NO	172	NO

Notes

[a] Expressed in feet.

[b] 95th Percentile queue results per Vistro (HCM Methodology).

Chapter 3
Summary

PROJECT DESCRIPTION

- The Project proposes the construction of a warehousing and manufacturing facility to include up to 466,120 sf of warehousing space, including up to 85,181 sf of ancillary office uses, and up to 14,000 sf of manufacturing space in four buildings. The Project Site, which is currently vacant and free of any structures, is bounded by Martin Luther King, Jr. Boulevard to the north, Alameda Street to the east, 41st Street to the south, and Long Beach Avenue to the west. The Project Site is located approximately 1.2 miles south of I-10, approximately 2.5 miles east of I-110, and approximately 3.8 miles west of I-710. Project traffic is anticipated to generate the highest traffic levels along I-10, and thus, the analysis below focuses on Project trips along I-10. Access to the Project is provided via four driveways along Martin Luther King, Jr. Boulevard and four driveways along 41st Street.

- I-10 is the closest Caltrans facility to the Project Site and, therefore, it is the freeway that is expected to experience the largest increase in Project traffic levels. This analysis investigated the potential Project traffic impacts on four I-10 freeway mainline segments, two ramp intersections, and two freeway off-ramps. These locations were analyzed using HCM methodology for Existing Scenario (Year 2014) and Future Scenario (Year 2035). The analysis year of 2014 was used in this analysis to be consistent with the Existing Scenario indicated in the 2014 Addendum.

- The Project will generate a net increase of 167 PCE trips in the morning peak hour and 179 PCE trips in the afternoon peak hour.

CUMULATIVE ANALYSIS – PROJECT PLUS 11 RELATED PROJECTS

- Project traffic will add between six and 22 trips per direction to any of the four freeway segments studied during the morning or afternoon peak hours. This incremental traffic addition should be compared to existing 2014 traffic levels between 7,200 vehicles per hour and 11,800 vehicles per hour in each direction (increasing to 8,900 and 14,500 vehicles per hour per direction under 2035 scenarios).

- Project traffic levels decrease 2014 operating speeds on the four study freeway mainline segments by 0.1 mph and increase operating density by 0.2 vehicles per mile per lane – both very small incremental changes which would not be considered significant.

- Year 2035 analyses show that the freeway will be over capacity in the westbound direction in the morning peak hour and in the eastbound direction in the afternoon peak hour – with or without the addition of Project traffic. Similar minor incremental changes are expected

under Year 2035 scenarios on mainline lanes in the off-peak direction and, thus, would not be considered significant.

- The Project is anticipated to add traffic to the long-range Year 2035 cumulative conditions, representing an average of 0.66% of the anticipated growth between Years 2014 and 2035.

- The ramp intersections are anticipated to operate at LOS C or better in 2014 and LOS D or better under all scenarios in 2035, regardless of the addition of Project and cumulative traffic. No significant impacts would result from the addition of Project traffic.

- The queues at the two off-ramps are anticipated not to extend beyond the available capacity under all scenarios in 2035, regardless of the addition of Project and cumulative traffic. No significant impacts would result.

- The addition of Project traffic is not large enough to create a substantial impact on the mainline lanes or the ramp intersections with the City street system. Project traffic does not add enough traffic to result in off-ramp queues backing out onto the freeway mainlines.

CUMULATIVE ANALYSIS – PROJECT PLUS SOLA VILLAGE AND 82 RELATED PROJECTS

- Appendix A presents an additional alternative cumulative analysis which measures the cumulative Project impacts under the assumption of the addition of Sola Village and the 82 related projects listed in its EIR.

- The 2035 freeway cumulative analysis found no substantial Project impacts for freeway mainline lanes, interchange intersections, or freeway off-ramp queues even with the addition of SOLA Village and its 82 related projects.

- Because of the larger growth in background traffic caused by the additional related projects, the proportion of growth associated with Project traffic is less than with the Related Projects. Again, the proportion of Project traffic makes up less than 1% of the total growth (0.34%).

CONCLUSION

Under long-range cumulative conditions (Year 2035), the addition of Project traffic is not large enough to create a substantial impact on the mainline freeway lanes or the ramp intersections with the City street system. Project traffic does not add enough traffic to result in off-ramp queues backing out onto the freeway mainlines.

These findings apply to the freeway cumulative impacts of the Project plus its Related Projects and to the Project plus SOLA Village and its 82 related projects.

Appendix A

Additional Alternative Cumulative Freeway Analysis (Including SOLA Village and its Related Projects)

Appendix A

Additional Alternative Cumulative Freeway Analysis (Including SOLA Village and its Related Projects)

This Appendix presents an additional alternative cumulative freeway analysis of Caltrans facilities to consider the potential cumulative freeway traffic impacts associated with the Project taking into account a larger number of related projects. This additional cumulative freeway analysis takes into account the Related Projects and SOLA Village and its 82 related projects listed in the SOLA Village EIR. This analysis includes projections of Year 2035 conditions with and without Project traffic and is consistent with the methodology, assumptions, and analysis outlined in the Cumulative Freeway Analysis above.

ANALYZED FACILITIES

As shown in Table A-1, the analyses included four freeway mainline segments, two signalized ramp intersections, and two off-ramp locations. All analyzed facilities were analyzed using the HCM methodology and is summarized below, with supporting data in the Attachment.

CUMULATIVE ANALYSIS OF FREEWAY MAINLINE SEGMENTS

The LOS definitions for freeway mainline segments based on HCM methodology are presented in Table A-2. Traffic volumes were projected for Year 2035 to reflect a 21-year horizon and are summarized in Table A-3. Consistent with the Cumulative Freeway Analysis, the existing traffic volumes were increased by both ambient growth (assumed to be 1% per year) and the Related Projects consistent with the 2016 FEIR. In addition, the traffic generated by the SOLA Village and its 82 related projects listed in SOLA Village EIR was also considered. Table A-4 lists the Related Projects included in the 2016 FEIR, the SOLA Village Project, and its 82 related projects.

Cumulative Freeway Mainline Segment Analysis – 2035

Table A-5 summarizes the results of the HCM analysis for Future without Project Scenario and Future with Project Scenario Year 2035.

The mainline freeway segment analysis shows that in the Year 2035 with the increased number of related projects added to the background conditions, all eight of the scenarios tested will operate over their capacity, even without the addition of Project traffic. Table A-3 shows that the Project traffic to be added to these freeway segments totals between six and 22 Project vehicles per hour as compared to the respective Year 2035 traffic levels between 8,900 and 14,500 vehicles per direction per hour. These incremental volume changes attributed to Project traffic are very small, and thus would not be considered significant.

Proportion of Growth Contribution by Project Traffic – Year 2035

As shown in Table A-6, the Project would add a maximum of 22 PCE trips per hour in one direction to any one Caltrans mainline facility. Because Caltrans does not provide specific incremental criteria by which to measure the significance of impacts to freeway mainline segments, there is not a standard to identify whether a specific facility would be significantly impacted. While the Project would contribute to future 2035 cumulative traffic growth on the freeway system, the Project traffic represents 0.1 to 0.60% of the projected growth on the freeway segments between 2014 and 2035. The Project traffic averages 0.34% of the new traffic growth on the two freeway segments during the peak periods of the day. Project traffic growth at its highest segment would represent the addition of one car every 15 minutes per lane of freeway, which is a very small incremental increase and is considered less than significant.

CUMULATIVE ANALYSIS OF INTERCHANGE INTERSECTIONS

The intersections under Caltrans jurisdiction, as listed in Table A-1, were analyzed using the HCM methodology and implemented using Vistro software. Table A-7 summarizes the LOS definitions for signalized intersections. Consistent with the Cumulative Freeway Analysis, the 2035 traffic

volumes were developed by increasing the existing traffic volumes with both ambient growth (assumed to be 1% per year) and cumulative related project traffic as listed in Table A-4.

As shown in Table A-1, this Caltrans analysis focuses on the two signalized freeway ramp locations on the I-10/Alameda Street interchange. Caltrans does not have specific criteria to determine significance of incremental changes in intersection operations. The intersections under Caltrans jurisdiction, as listed in Table A-1, were analyzed using the HCM methodology and implemented using Vistro software. Table A-7 summarizes the LOS definitions for signalized intersections.

Cumulative Intersection Analysis – Year 2035

Table A-8 summarizes the results of the signalized HCM analysis for Future without and with Project Scenario for Year 2035. The ramp intersections are anticipated to operate at LOS D or better under all scenarios, regardless of the addition of Project traffic.

The addition of Project traffic to Year 2035 cumulative conditions would result in an increase in intersection delay of 0.7 to 2.2 seconds. While Caltrans does not have a threshold for significant impacts at intersections, LADOT's threshold of significance is an increase in intersection delay of 6.0 seconds at LOS C and 4.0 seconds at LOS D[10], and thus, the addition of Project traffic to Year 2035 scenarios (even with the addition of the SOLA Village project and its 82 related projects to the background conditions) would not result in a significant impact under LADOT standards.

Table A-8 shows that the two study interchange intersections would operate at LOS C or D with or without the Project in place. Neither intersection would experience an increase in delay approaching the LADOT thresholds and, therefore, no significant impact would result.

[10] *Traffic Study Policies and Procedures*, p.16, Los Angeles Department of Transportation, August 2014

CUMULATIVE ANALYSIS OF OFF-RAMP QUEUES

Two off-ramps from I-10 were analyzed to determine whether the lengths of the ramps were sufficient to accommodate vehicle queue lengths. The queue lengths were estimated using Vistro software, which reports the 95th percentile queue length, in feet, for each approach lane on the off-ramp.

The assessment of the off-ramps included a review of the vehicle queue length as compared to the total available queuing capacity of the ramp to determine whether the vehicle queue would extend beyond the length of the ramp onto the mainline. To this end, the queuing analysis looks at two separate components of ramp capacity: the first is the length of each approach lane to the intersection, and the second looks at the remaining length of the ramp, behind any approach lane delineation lines, to the gore point where the ramp diverges from the freeway mainline. The queue may exceed the striped length of a given approach lane, as long as there is sufficient additional queuing capacity on the ramp so that the queue will not spill over onto the mainline.

Cumulative Off-Ramp Queue Analysis – Year 2035

The Year 2035 traffic volumes were developed by increasing the existing traffic volumes by both ambient growth (assumed to be 1% per year) and cumulative related project traffic. Table A-9 summarizes the results of the queuing analysis for Future without and with Project Scenario for Year 2035.

The queues at the two off-ramps do not extend beyond the available capacity under Future Scenario (Year 2035), without and with the addition of Project traffic. The addition of Project traffic does not substantially increase the off-ramp queue under any of the scenarios tested above (less than one vehicle length during any of the scenarios tested). Therefore, the addition of Project traffic will not cause a significant impact at either ramp location.

SUMMARY

- I-10 is the closest Caltrans facility to the Project Site and, therefore, it is the freeway that is expected to experience the largest increase in Project traffic levels. This analysis

investigated the potential Project traffic impacts on four I-10 freeway mainline segments, two ramp intersections, and two freeway off-ramps. These locations were analyzed using HCM methodology for future cumulative conditions (Year 2035) with the following elements included in the future cumulative traffic projections:

  - 1% annual background traffic growth between 2014 and 2035
  - Related Projects listed in the 2016 FEIR
  - 82 Related Projects listed in the SOLA Village EIR
  - The SOLA Village Project

- The Project will generate a net increase of 179 PCE trips in the morning peak hour and 190 PCE trips in the afternoon peak hour.

- Project traffic will add between six and 22 trips per direction to any of the four freeway segments studied during the morning or afternoon peak hours. This incremental traffic addition should be compared to projected cumulative 15,157 and 16,329 vehicles per hour per direction under 2035 scenarios.

- Year 2035 cumulative analyses show that the freeway will be over capacity in both directions during the morning and afternoon peak hours – with or without the addition of Project traffic.

- The Project is anticipated to add traffic to the long-range cumulative conditions, representing an average of 0.34% of the anticipated growth between now and 2035.

- The ramp intersections are anticipated to operate at LOS D or better under all scenarios in 2035, regardless of the addition of Project and cumulative traffic. No significant impacts would result from the addition of Project traffic.

- The queues at the two off-ramps are anticipated not to extend beyond the available capacity under all scenarios in 2035, regardless of the addition of Project and cumulative traffic. No significant impacts would result.

- The addition of Project traffic is not large enough to create a substantial impact on the mainline lanes or the ramp intersections with the City street system. Project traffic does not add enough traffic to result in off-ramp queues backing out onto the freeway mainlines.

- The addition of the SOLA Village project and its 82 related projects does not change the conclusions of the Project Cumulative Freeway Analysis. The Project will still have no significant impacts on the mainline freeway lanes, the ramp intersections, or the freeway off-ramp queues.

TABLE A-1
ANALYZED CALTRANS FACILITIES

ID	Location
Freeway Mainline Segments	
FS-1a	I-10 between San Pedro Street/Central Avenue & Alameda Street -- Eastbound
FS-1b	I-10 between San Pedro Street/Central Avenue & Alameda Street -- Westbound
FS-2a	I-10 between Alameda Street & Santa Fe Avenue -- Eastbound
FS-2b	I-10 between Alameda Street & Santa Fe Avenue -- Westbound
Signalized Ramp Intersections	
S-1.	Alameda Street & I-10 Eastbound Ramps
S-2.	Alameda Street & 14th Street / I-10 Westbound Off-Ramp
Off-ramp Queues	
Q-1.	Alameda Street & I-10 Eastbound Off-Ramp
Q-2.	Alameda Street & I-10 Westbound Off-Ramp

TABLE A-2
FREEWAY SEGMENT LEVEL OF SERVICE

Level of Service	Description	Density [a]
A	Free-flow speeds prevail. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream.	≤ 11
B	Free-flow speeds are maintained. The ability to maneuver with the traffic stream is only slightly restricted.	> 11 and ≤ 18
C	Flow with speeds at or near free-flow speeds. Freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver.	> 18 and ≤ 26
D	Speeds decline slightly with increasing flows. Freedom to maneuver with the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort.	> 26 and ≤ 35
E	Operation at capacity. There are virtually no usable gaps within the traffic stream, leaving little room to maneuver. Any disruption can be expected to produce a breakdown with queuing.	> 35 and ≤ 45
F	Represents a breakdown in flow and oversaturated conditions.	> 45

Notes

Source: *Highway Capacity Manual, 6th Edition, A Guide for Multimodal Mobility Analysis* (Transportation Research Board, 2016) (HCM methodology) and Caltrans.

[a] Density is defined in vehicles per mile per lane and describes the proximity to other vehicles and is related to the freedom to maneuver within the traffic stream (HCM methodology).

TABLE A-3
FREEWAY MAINLINE SEGMENT TRAFFIC VOLUMES

ID	Freeway Mainline Segment	Peak Hour	Direction	Vehicles per Hour (VPH)		
				Future without Project Scenario (Year 2035)	Future with Project Scenario (Year 2035)	Project Only Volumes
FS-1.	I-10 between San Pedro Street/Central Avenue & Alameda Street	AM Peak Hour	EB	10,857	10,878	21
			WB	15,151	15,157	6
		PM Peak Hour	EB	16,307	16,315	8
			WB	11,920	11,941	21
FS-2.	I-10 between Alameda Street & Santa Fe Avenue	AM Peak Hour	EB	10,848	10,855	7
			WB	15,148	15,168	20
		PM Peak Hour	EB	16,307	16,329	22
			WB	11,919	11,926	7

TABLE A-4
RELATED PROJECTS

No.	Project	Address	Use	Trip Generation						
				Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
2016 FEIR Related Projects [a]										
1.	Affordable Housing and Comm/Retail	937 E. Adams Boulevard	80 apartment units and ground floor retail	1,298	65	91	156	51	42	93
2.	Mini-shopping Center	4051 S. Avalon Boulevard	23,787 sf mini-shopping center	1,056	78	85	163	28	36	64
3. [b]	Mixed-use Apartments and Retail	220 E. Washington Boulevard	78 apartment units and 5,600 sf retail	762	26	48	74	36	24	60
4.	Warehouse, Office, Light Industrial	2455 E. Washington Boulevard	446,230 sf warehouse, office, light industrial	1,906	127	34	161	43	129	172
5.	Buying and Selling and Storage Facility	1571 E. Adams Boulevard	5,224 sf warehousing and auto transmission and engine sales	22	1	1	2	1	2	3
6.	Conversion of Church into a Coin Laundry	5300 S. Central Avenue	6,942 sf conversion of church to coin laundry	308	23	25	48	8	11	19
7.	Buy back Collection Recycling Center	1742 E. 14th Street	6,712 sf collection recycling center	298	22	24	46	8	10	18
8.	Church Expansion and Remodel	1308 E. 46th Street	3,484 sf church expansion and remodel	32	1	1	2	1	1	2
9.	2-lot Industrial Condominiums	2900 E. Lugo Street	8 condominium units	292	4	18	22	17	9	26
10.	Converting Manufac. to Indoor Swap Meet	3110 E. 12th Street	39,400 sf retail	1,748	129	140	269	47	60	107
11.	Unmanned Wireless Telecom Facility	5600 S. Central Avenue	Unmanned wireless telecommunications facility [c]	--	--	--	--	--	--	--
Additional Related Projects [d]										
1.	Mixed-Use Project	662 S. Lucas Avenue	130 condominium units and 7,037 sf retail	1,400	21	84	105	75	47	122
2.	400 S Broadway Mixed-Use Project	400-416 Broadway	450 apartment units and 7,500 sf retail	2,266	36	147	183	139	73	212
3.	1133 Hope Street Project	1133 Hope Street	208 condominium units and 5,029 sf retail	1,543	20	74	94	91	50	141
4.	Restaurant & Bar	220 W. 9th Street	23,000 sf restaurant/bar	1,582	0	0	0	87	43	130
5.	8th & Grand Mixed-Use Project	710 S. Grand Avenue	700 condominium units, 27,000 sf retail, and 5,000 sf restaurant	3,131	37	144	181	162	100	262
6.	L.A. Trade Tech College - 5 Year Master Plan	400 Washington Boulevard	6,300 students	8,420	336	127	463	574	268	842
7.	Mixed-Use	1148 S. Broadway	94 apartment units and 2,500 sf retail	553	8	30	38	32	18	50
8.	Mixed-Use (Herald Examiner)	146 W. 11th Street	391 apartment units, 39,720 sf office, and 40,000 sf retail	5,198	144	176	319	258	274	532
9.	USC All Sports Building	1010 W. Jefferson Boulevard	91,130 sf athletic building	92	4	4	8	6	4	10
10.	USC Master Plan	W. Jefferson Blvd/Figueroa St	202,000 sf shopping center, 45,000 sf restaurant, 2,000 seat movie theater, 40,000 sf supermarket, 20,000 sf health/fitness club, 150 hotel rooms, 250 apartment units, and 540 students	13,574	469	264	732	490	567	1,057
11.	LASED Entertainment District	Figueroa St/11th St	1,620 apartment units, 95,706 sf educational, 174,769 sf retail, 70,052 sf restaurant, 15,670 sf health club, 1,980 sf sports bar, 222 hotel rooms, 367,300 sf office, 298,500 sf production studio, and 250,000 sf convention center expansion	24,762	473	292	771	775	1,108	1,883
12.	Metropolis Mixed-Use	851 S. Francisco Street	480 hotel rooms, 836 condominium units, 988,225 sf office, and 46,000 sf retail	8,010	307	318	625	386	512	899
13.	Mixed-Use Development	745 S. Spring Street	247 condominium units and 10,675 sf retail	1,543	23	67	90	80	60	140
14.	Child Care	3014 S. Royal Street	7,997 sf child care facility	499	48	43	91	43	49	92
15.	Mixed-Use Residential, Retail and Restaurant	1150 S. Grand Avenue	374 condominium units, 9,844 sf retail, and 7,600 sf restaurant	2,074	47	114	160	109	70	179
16.	Mixed-Use	1050 S. Grand Avenue	128 condominium units, 3,472 sf retail, and 2,200 sf restaurant	676	8	33	41	38	23	61
17.	Mixed-Use Residential, Retail and Restaurant	609 W. 8th Street	225 condominium units, 200 hotel rooms, 30,000 sf retail, and 32,000 sf restaurant	4,908	90	104	194	242	159	401
18.	Mixed-Use Residential and Retail	1115 S. Hill Street	172 condominium units and 6,850 sf restaurant	543	(45)	40	(5)	50	(7)	43
19.	Mixed-Use Development (Pacific Electric Building)	610 S. Main Street	13,921 sf restaurant, 726 sf retail, and 726 sf pool/event	1,429	11	11	22	78	39	117
20.	Mixed-Use	1329 W. 7th Street	94 apartment units and 2,000 sf retail	662	16	37	53	39	22	61
21.	1212 Flower	1212 Flower Street	730 apartment units, 10,500 sf retail/restaurant, and 70,465 sf office	3,956	78	233	311	229	121	350
22.	Park/Fifth Project	427 W. 5th Street	615 apartment units and 16,310 sf restaurant	3,134	42	115	158	164	97	261
23.	Kawada Tower	240 S. Hill Street	330 condominium units and 12,000 sf retail	1,551	21	103	124	92	46	138
24.	Bunker Hill Design & Development Program EIR - Parcel Y	3rd St/Olive St/Hill St/4th St	960,000 sf office and 100,000 sf retail	8,004	473	74	547	188	660	848
25.	Grand Avenue Project	1st St/Grand Ave/Hill St/Upper 2nd St & GTK Way/Hope St/Upper 2nd St	1,648 condominium units, 412 apartment units, 681,000 sf office, 53,000 sf supermarket, 67,000 sf restaurant, 225,300 sf retail, 250-seat event facility, 50,000 sf health club, and 275 hotel rooms	22,601	919	632	1,551	1,120	1,344	2,464
26.	Mixed-Use	820 S. Olive Street	589 apartment units and 4,500 sf retail	3,309	63	202	264	195	106	302
27.	City Corp Plaza Phase III	755 S. Figueroa Street	792,000 sf office	4,677	616	83	699	117	571	688
28.	Mixed-Use Development	1027 W. Wilshire Project	407 condominium units and 7,472 sf retail	1,498	21	92	113	83	53	136
29.	Mixed-Use	1135 W. 7th Street	130 condominium units and 7,000 sf retail	798	5	39	44	42	41	63
30.	Restaurant Project	1036 S. Grand Avenue	7,149 sf restaurant	492	2	3	5	27	14	41
31.	1001 S Olive	1001 S. Olive Street	225 apartment units and 5,000 sf retail	1,581	22	79	101	94	51	145
32.	Apartments	1247 S. Grand Avenue	118 apartment units and 5,125 sf retail	763	10	41	51	42	25	67
33.	Residential Project	1500 S. Figueroa Street	190 apartment units and 10,922 sf retail	1,199	18	67	85	71	40	111
34.	Witmer Project	1247 W. 7th Street	186 condominium units and 6,200 sf retail	731	10	49	59	53	10	63
35.	1400 S Figueroa Residential Project	1400 S. Figueroa Street	106 apartment units and 4,834 sf retail	647	10	38	48	39	22	61
36.	Olive/Olympic Project	960 S Olive St	263 apartment units and 14,500 sf restaurant	2,266	25	91	116	133	70	203
37.	Day Care & Health Clinic	1010 E. Jefferson Boulevard	6,170 sf daycare and 5,310 sf health clinic	681	49	43	92	48	53	101
38.	801 S Olive Street Project	801 S. Olive Street	363 apartment units, 2,500 sf retail, and 7,500 sf restaurant	2,557	33	129	162	149	83	232
39.	Condominiums	810 E. Pico Boulevard	181,620 sf retail	1,889	54	34	88	59	63	122
40.	Variety Arts Project	940 S. Figueroa Street	3,295 sf office, 2,080 sf bar, 1,750 visitors, 30 employees, 400 visitors, 15 employees	1,954	132	1	133	55	138	193

TABLE D-4 (CONTINUED)
RELATED PROJECTS

No.	Project	Address	Use	Trip Generation [a]						
				Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
41.	Hellman/Banco Building	354 S. Spring Street	212 apartment units	1,410	22	86	108	85	46	131
42.	Mixed-Use Building	233 W. Washington Boulevard	160 apartment units and 24,000 sf retail	1,764	25	56	81	89	71	160
43.	Good Samaritan Mixed-Use Project	1136 W. 6th Street	725 apartment units and 39,999 sf retail	3,800	26	204	230	227	114	341
44.	Residential Project	534 S. Main Street	160 apartment units, 18,000 sf retail, and 3,500 sf restaurant	2,213	52	75	127	87	58	145
45.	Condominiums	1340 S. Olive Street	150 condominium units	879	11	56	67	53	26	78
46.	Hill Mixed	920 S. Hill Street	216 apartment units and 3,900 sf retail	1,311	21	76	97	78	44	122
47.	Broadway Mixed	955 S. Broadway	201 apartment units and 6,000 sf retail	1,275	21	72	93	74	43	117
48.	Office	1130 W. Wilshire Boulevard	88,224 sf office, 20 students, 248 sf high turnover restaurant, and 5,375 sf quality restaurant	964	92	12	104	28	61	89
49.	Embassy Tower	848 S. Grand Avenue	420 condominium units and 38,500 sf market	3,882	66	144	210	212	165	377
50.	Legal Aid Foundation of LA	1550 W. 8th Street	22,000 sf office	230	29	4	33	6	26	32
51.	Oak Village Residences	902 W. Washington Boulevard	142 condominium units	482	2	25	27	35	16	51
52.	Wilshire Grand Redevelopment Project	900 W. Wilshire Boulevard	560 hotel rooms, 100 apartment units, 1,500,000 sf office, 20,000 sf fitness facility, and 50,000 sf retail/restaurant	3,624	725	75	800	94	764	858
53.	Washington Bl Opportunity MU (Mercy Hsg)	220 E. Washington Boulevard	230 new apartment units, 32 renovated apartment units, and 19,000 sf retail/restaurant	2,113	38	118	156	125	53	178
54.	Mixed-Use	2100 S. Figueroa Street	291 condominium units and 7,134 sf retail	870	(82)	66	(16)	67	(28)	39
55.	DTLA South Park - Site 1	1120 S. Grand Avenue	461 apartment units, 300 hotel rooms, and 8,700 sf retail	3,878	110	143	252	167	136	303
56.	DTLA South Park - Site 4	1230 S. Olive Street	362 apartment units and 4,000 sf retail	2,114	31	126	157	127	69	196
57.	Sports Museum	1900 S. Main Street	32,000 sf museum	762	0	0	0	21	55	76
58.	New Medical Office Building (Good Samaritan Hospital)	Wilshire Blvd/Witmer St	150,000 sf hospital	5,420	294	78	372	150	408	558
59.	Mixed-Use Residential and Retail	1901 W. 7th Street	172 apartment units and 32,800 sf retail	1,504	29	61	90	75	58	133
60.	1700 W Olympic Hotel	1700 W. Olympic Boulevard	160 hotel rooms	1,157	44	32	76	45	42	87
61.	Mixed-Use	1111 W. Wilshire Boulevard	420 condominium units, 140 hotel rooms, and 7,500 sf restaurant	2,790	55	124	179	140	81	221
62.	Apartments	2455 S. Figueroa Street	145 apartment units	870	13	51	64	53	29	82
63.	Flower/23rd Mixed-Use	2300 S. Flower Street	1,500 apartment units and 40,000 sf retail	1,598	(116)	242	126	209	(57)	152
64.	Case Hotel	1106 S. Broadway	151 hotel rooms	1,234	47	33	80	46	45	91
65.	Apartments	2819 S. Griffith Avenue	458 apartment units	3,078	47	187	234	185	99	284
66.	Sparkle Factory	908 S. Broadway	11,900 sf office and 11,900 sf retail	639	24	6	30	24	38	62
67.	1000 Grand Project	1000 Grand Avenue	274 apartment units and 12,000 sf restaurant	2,216	27	94	121	130	69	199
68.	Olympic/Hill Project	301 W Olympic Blvd	300 apartment units, 14,500 sf retail, and 8,500 sf restaurant	2,496	30	104	134	143	82	225
69.	Residential Project	1360 S. Figueroa Street	443 apartment units and 11,000 sf retail	3,416	52	185	237	199	117	316
70.	Spring Street Garage & Apartments	Spring St S/O 5th St	120 apartment units	798	12	49	61	48	26	74
71.	Residential Project	435 20th Street	143 apartment units	628	8	39	47	37	18	55
72.	SB Omega	601 S. Main Street	350 apartment units and 32,000 sf retail	2,536	39	132	171	145	90	235
73.	9th/Olive Project	840/888 S. Olive Street	303 apartment units, 9,680 sf retail, and 1,500 sf restaurant	3,007	81	166	247	174	96	270
74.	Residential Project	1340 S. Figueroa Street	252 apartment units and 11,000 sf restaurant	1,781	29	89	118	101	65	166
75.	Clark Hotel	426 S. Hill Street	347 hotel rooms	2,835	118	76	194	109	96	205
76.	USC Student Housing	505-511 W. 31st Street	30 student housing rooms	200	3	12	15	12	7	19
77.	Onyx Apartment	1300 S Hope St	419 apartment units, 29,200 sf retail, 6,400 sf quality restaurant, and 6,400 sf fast-food restaurant	4,280	88	105	193	136	102	238
78.	Valencia Project	1501 W Wilshire Blvd	218 apartment units, 6,000 sf retail, and 1,500 sf restaurant	816	(54)	12	(42)	31	(16)	15
79.	City Market Project	1057 S San Pedro St	1,400 students, 176,733 sf retail, 744 cinema seats, 945 apartment units, 210 hotel rooms, and 294,641 sf office	16,433	837	434	1,271	632	957	1,589
80.	G12 Project	1200 S Grand Ave	640 apartment units, 30,000 sf retail, and 10,000 sf restaurant	4,886	92	148	240	181	134	315
81.	Residential Project	1027 S. Olive Street	100 apartment units	632	9	39	48	38	21	59
82.	Mixed-Use	928 S. Broadway	662 apartment units, 47,000 sf retail, 11,000 sf live/work, and 34,824 sf office	4,715	21	229	250	272	109	381
83.	The Reef - LA Mart/SOLA Village	1900 S Broadway	900 condominium units, 550 apartment units, 210 hotel rms, 143,100 sf retail, 180,000 sf office, 17,600 sf gallery/museum, and 8,000 sf gym	--	390	552	942	637	566	1,203

Notes

[a] Related project information per 2016 FEIR

[b] Related project information per 2014 Addendum Traffic Study

[c] Non-traffic generator

[d] Related project information per SOLA Village EIR.

TABLE A-5
FUTURE OPERATING SCENARIOS (YEAR 2035)
FREEWAY SEGMENT LEVEL OF SERVICE EVALUATION

ID	Freeway Segment	Peak Hour	Direction	Future without Project Scenario			Future with Project Scenario		
				Speed [a][b]	**Density** [b][c]	**LOS**	**Speed** [a][b]	**Density** [b][c]	**LOS**
FS-1.	I-10 between San Pedro Street/Central Avenue & Alameda Street	AM	EB	Overflow	Overflow	F	Overflow	Overflow	F
			WB	Overflow	Overflow	F	Overflow	Overflow	F
		PM	EB	Overflow	Overflow	F	Overflow	Overflow	F
			WB	Overflow	Overflow	F	Overflow	Overflow	F
FS-2.	I-10 between Alameda Street & Santa Fe Avenue	AM	EB	Overflow	Overflow	F	Overflow	Overflow	F
			WB	Overflow	Overflow	F	Overflow	Overflow	F
		PM	EB	Overflow	Overflow	F	Overflow	Overflow	F
			WB	Overflow	Overflow	F	Overflow	Overflow	F

Notes

Overflow: Traffic demand exceeds the available capacity of the freeway mainline segment.

[a] Mean speed measured in miles per hour (mph).

[b] Methodology from *Highway Capacity Manual, 6th Edition, A Guide for Multimodal Mobility Analysis* (Transportation Research Board, 2016) (HCM methodology).

[c] Measured in vehicles per mile per lane (v/m/l) for freeways with a free-flow speed of 58.2 mph. Free-flow speed, as defined in HCM methodology, is the theoretical speed when the density and flow rate of the freeway mainline segment are both zero.

TABLE A-6
PROPORTION OF PROJECTED FUTURE TRAFFIC
FUTURE YEAR 2035 SCENARIOS

ID	Freeway Mainline Segment	Peak Hour	Direction	Vehicles per Hour (VPH)				Proportion of Project-Related Traffic
				Existing	Background Growth (Ambient Growth + Related Project Traffic)	Project	Total Growth	
FS-1.	I-10 between San Pedro Street/Central Avenue & Alameda Street	AM Peak Hour	EB	7,636	3,221	21	3,242	0.60%
			WB	11,472	3,679	6	3,685	0.20%
		PM Peak Hour	EB	9,895	6,412	8	6,420	0.10%
			WB	7,246	4,674	21	4,695	0.40%
FS-2.	I-10 between Alameda Street & Santa Fe Avenue	AM Peak Hour	EB	7,826	3,022	7	3,029	0.20%
			WB	11,758	3,390	20	3,410	0.60%
		PM Peak Hour	EB	10,142	6,165	22	6,187	0.40%
			WB	7,426	4,493	7	4,500	0.20%
Average Proportion of Project-Related Traffic to Mainline Segments								**0.34%**

TABLE A-7
INTERSECTION LEVEL OF SERVICE

Level of Service	Description	Delay [a]
		Signalized Intersections
A	EXCELLENT. No vehicle waits longer than one red light and no approach phase is fully used.	≤ 10
B	VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.	> 10 and ≤ 20
C	GOOD. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.	> 20 and ≤ 35
D	FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.	> 35 and ≤ 55
E	POOR. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.	> 55 and ≤ 80
F	FAILURE. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Tremendous delays with continuously increasing queue lengths.	> 80

Notes

Source: *Highway Capacity Manual, 6th Edition, A Guide for Multimodal Mobility Analysis* (Transportation *Research Board, 2016).*

[a] Measured in seconds.

TABLE A-8
FUTURE WITH PROJECT SCENARIOS (YEAR 2035)
INTERSECTION PEAK HOUR LEVELS OF SERVICE

No.	Intersection	Peak Hour	Future without Project Scenario		Future with Project Scenario	
			Delay	LOS	Delay	LOS
S-1.	Alameda Street & I-10 Eastbound Ramps	A.M. P.M.	27.2 39.0	C D	28.2 41.2	C D
S-2.	Alameda Street & 14th Street / I-10 Westbound Off-Ramp	A.M. P.M.	35.3 50.8	D D	36.0 51.6	D D

Notes

Delay is measured in seconds per vehicle

LOS = Level of service

Results per Vistro (HCM methodology).

TABLE A-9
FREEWAY OFF-RAMP QUEUE EVALUATION
FUTURE OPERATING SCENARIOS (YEAR 2035)

ID	Freeway Off-ramp	Ramp and Lane Description	Vehicle Storage Capacity [a]	Future without Project Scenario				Future with Project Scenario			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Vehicle Queue Length [b]	Exceeds Capacity?	Vehicle Queue Length [b]	Exceeds Capacity?	Vehicle Queue Length [b]	Exceeds Capacity?	Vehicle Queue Length [b]	Exceeds Capacity?
Q-1.	Alameda Street &	I-10 Eastbound Off-Ramp									
	I-10 Eastbound Ramps	Left	255	255		255		255		255	
		Right	255	255		255		255		255	
		Ramp	870	349	NO	443	NO	379	NO	460	NO
Q-2.	Alameda Street &	I-10 Westbound Off-Ramp									
	14th Street / I-10 Westbound Off-Ramp	Left	220	201		220		220		220	
		Shared Left/Through	350	196		350		211		350	
		Right	350	25		50		25		50	
		Ramp	890	0	NO	171	NO	1	NO	200	NO

Notes

[a] Expressed in feet.

[b] 95th Percentile queue results per Vistro (HCM Methodology).

Attachment

ADDITIONAL FREEWAY ANALYSIS - FUTURE WITHOUT PROJECT CONDITIONS (YEAR 2035)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Eastbound

west of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	10,857	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS):	BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*	[f_{LW}:	0.00	]	
		[f_{RLC}:	0.00	]	
		FFS:	52.4	mi/h	
Adjusted Free Flow Speed (FFS_{adj}):	FFS x SAF *(Eq. 12-5)*	FFS_{adj}:	52.4	mi/h	
Basic Freeway Seg. Capacity (c):	2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)*	c:	2,224	pc/h/ln	
Adj. Freeway Seg. Capacity (c_{adj}):	c x CAF *(Eq. 12-8)*	c_{adj}:	2,224	pc/h/ln	
Breakpoint (BP):	[1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)*	BP:	1,904	pc/h/ln	
Flow Rate (v_p):	$\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*	[f_{HV}:	0.965	]	
		v_p:	2,369	pc/h/ln	

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S):	If $v_p \leq BP$: FFS_{adj} *(Eq. 12-1)*			
	If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$			
		S:	**n/a**	mi/h
Density (D):	$D = v_p / S$ *(Eq. 12-11)*	D:	**n/a**	pc/mi/ln
Level of Service (LOS):		LOS:	**F**	

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

ADDITIONAL FREEWAY ANALYSIS - FUTURE WITHOUT PROJECT CONDITIONS (YEAR 2035)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Westbound

west of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	15,151	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 3,305 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq BP$: FFS_{adj}

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **n/a** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* D: **n/a** pc/mi/ln

Level of Service (LOS): LOS: **F**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

ADDITIONAL FREEWAY ANALYSIS - FUTURE WITHOUT PROJECT CONDITIONS (YEAR 2035)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Eastbound

east of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	10,848	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS):	BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*	[f_{LW}:	0.00	]	
		[f_{RLC}:	0.00	]	
		FFS:	52.4	mi/h	
Adjusted Free Flow Speed (FFS_{adj}):	FFS x SAF *(Eq. 12-5)*	FFS_{adj}:	52.4	mi/h	
Basic Freeway Seg. Capacity (c):	2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)*	c:	2,224	pc/h/ln	
Adj. Freeway Seg. Capacity (c_{adj}):	c x CAF *(Eq. 12-8)*	c_{adj}:	2,224	pc/h/ln	
Breakpoint (BP):	[1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)*	BP:	1,904	pc/h/ln	
Flow Rate (v_p):	$\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*	[f_{HV}:	0.965	]	
		v_p:	2,367	pc/h/ln	

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S):	If $v_p \leq BP$: FFS_{adj}	*(Eq. 12-1)*			
	If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$				
		S:	**n/a**	mi/h	
Density (D):	$D = v_p / S$ *(Eq. 12-11)*	D:	**n/a**	pc/mi/ln	
Level of Service (LOS):		LOS:	**F**		

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

ADDITIONAL FREEWAY ANALYSIS - FUTURE WITHOUT PROJECT CONDITIONS (YEAR 2035)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Westbound

east of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	15,148	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 3,305 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq BP$: FFS_{adj}

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **n/a** mi/h

Density (D): D = v_p / S *(Eq. 12-11)* D: **n/a** pc/mi/ln

Level of Service (LOS): LOS: **F**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

ADDITIONAL FREEWAY ANALYSIS - FUTURE WITHOUT PROJECT CONDITIONS (YEAR 2035)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Eastbound

west of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	16,307	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS):	BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*	[f_{LW}:	0.00	]	
		[f_{RLC}:	0.00	]	
		FFS:	52.4	mi/h	
Adjusted Free Flow Speed (FFS_{adj}):	FFS x SAF *(Eq. 12-5)*	FFS_{adj}:	52.4	mi/h	
Basic Freeway Seg. Capacity (c):	2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)*	c:	2,224	pc/h/ln	
Adj. Freeway Seg. Capacity (c_{adj}):	c x CAF *(Eq. 12-8)*	c_{adj}:	2,224	pc/h/ln	
Breakpoint (BP):	[1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)*	BP:	1,904	pc/h/ln	
Flow Rate (v_p):	$\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*	[f_{HV}:	0.965	]	
		v_p:	3,558	pc/h/ln	

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S):	If $v_p \leq BP$: FFS_{adj}	*(Eq. 12-1)*			
	If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$				
		S:	**n/a**	mi/h	
Density (D):	$D = v_p / S$ *(Eq. 12-11)*	D:	**n/a**	pc/mi/ln	
Level of Service (LOS):		LOS:	**F**		

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

ADDITIONAL FREEWAY ANALYSIS - FUTURE WITHOUT PROJECT CONDITIONS (YEAR 2035)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Westbound

west of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	11,920	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS):	BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*	[f_{LW}:	0.00	]	
		[f_{RLC}:	0.00	]	
		FFS:	52.4	mi/h	
Adjusted Free Flow Speed (FFS_{adj}):	FFS x SAF *(Eq. 12-5)*	FFS_{adj}:	52.4	mi/h	
Basic Freeway Seg. Capacity (c):	2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)*	c:	2,224	pc/h/ln	
Adj. Freeway Seg. Capacity (c_{adj}):	c x CAF *(Eq. 12-8)*	c_{adj}:	2,224	pc/h/ln	
Breakpoint (BP):	[1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)*	BP:	1,904	pc/h/ln	
Flow Rate (v_p):	$\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*	[f_{HV}:	0.965	]	
		v_p:	2,600	pc/h/ln	

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S):	If $v_p \leq BP$: FFS_{adj} *(Eq. 12-1)*			
	If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$			
		S:	**n/a**	mi/h
Density (D):	$D = v_p / S$ *(Eq. 12-11)*	D:	**n/a**	pc/mi/ln
Level of Service (LOS):		LOS:	**F**	

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

ADDITIONAL FREEWAY ANALYSIS - FUTURE WITHOUT PROJECT CONDITIONS (YEAR 2035)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Eastbound

east of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	16,307	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 3,558 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): If $v_p \leq BP$: FFS_{adj} *(Eq. 12-1)*

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **n/a** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* D: **n/a** pc/mi/ln

Level of Service (LOS): LOS: **F**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

ADDITIONAL FREEWAY ANALYSIS - FUTURE WITHOUT PROJECT CONDITIONS (YEAR 2035)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Westbound

east of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	11,919	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS):	BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*	[f_{LW}:	0.00	]	
		[f_{RLC}:	0.00	]	
		FFS:	52.4	mi/h	
Adjusted Free Flow Speed (FFS_{adj}):	FFS x SAF *(Eq. 12-5)*	FFS_{adj}:	52.4	mi/h	
Basic Freeway Seg. Capacity (c):	2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)*	c:	2,224	pc/h/ln	
Adj. Freeway Seg. Capacity (c_{adj}):	c x CAF *(Eq. 12-8)*	c_{adj}:	2,224	pc/h/ln	
Breakpoint (BP):	[1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)*	BP:	1,904	pc/h/ln	
Flow Rate (v_p):	$\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*	[f_{HV}:	0.965	]	
		v_p:	2,600	pc/h/ln	

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S):	If $v_p \leq BP$: FFS_{adj}			*(Eq. 12-1)*	
	If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$				
		S:	**n/a**	mi/h	
Density (D):	$D = v_p / S$ *(Eq. 12-11)*	D:	**n/a**	pc/mi/ln	
Level of Service (LOS):		LOS:	**F**		

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

ADDITIONAL FREEWAY ANALYSIS - FUTURE WITH PROJECT CONDITIONS (YEAR 2035)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Eastbound

west of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	10,878	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS):	BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*	[f_{LW}:	0.00	]	
		[f_{RLC}:	0.00	]	
		FFS:	52.4	mi/h	
Adjusted Free Flow Speed (FFS_{adj}):	FFS x SAF *(Eq. 12-5)*	FFS_{adj}:	52.4	mi/h	
Basic Freeway Seg. Capacity (c):	2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)*	c:	2,224	pc/h/ln	
Adj. Freeway Seg. Capacity (c_{adj}):	c x CAF *(Eq. 12-8)*	c_{adj}:	2,224	pc/h/ln	
Breakpoint (BP):	[1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)*	BP:	1,904	pc/h/ln	
Flow Rate (v_p):	$\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*	[f_{HV}:	0.965	]	
		v_p:	2,373	pc/h/ln	

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S):	If $v_p \leq BP$: FFS_{adj} *(Eq. 12-1)*			
	If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$			
		S:	**n/a**	mi/h
Density (D):	$D = v_p / S$ *(Eq. 12-11)*	D:	**n/a**	pc/mi/ln
Level of Service (LOS):		LOS:	**F**	

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

ADDITIONAL FREEWAY ANALYSIS - FUTURE WITH PROJECT CONDITIONS (YEAR 2035)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Westbound

west of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	15,157	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 3,307 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq BP$: FFS_{adj}

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **n/a** mi/h

Density (D): D = v_p / S *(Eq. 12-11)* D: **n/a** pc/mi/ln

Level of Service (LOS): LOS: **F**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

ADDITIONAL FREEWAY ANALYSIS - FUTURE WITH PROJECT CONDITIONS (YEAR 2035)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Eastbound

east of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	10,855	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_c):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS):	BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*	[f_{LW}:	0.00	]	
		[f_{RLC}:	0.00	]	
		FFS:	52.4	mi/h	
Adjusted Free Flow Speed (FFS_{adj}):	FFS x SAF *(Eq. 12-5)*	FFS_{adj}:	52.4	mi/h	
Basic Freeway Seg. Capacity (c):	2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)*	c:	2,224	pc/h/ln	
Adj. Freeway Seg. Capacity (c_{adj}):	c x CAF *(Eq. 12-8)*	c_{adj}:	2,224	pc/h/ln	
Breakpoint (BP):	[1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)*	BP:	1,904	pc/h/ln	
Flow Rate (v_p):	$\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*	[f_{HV}:	0.965	]	
		v_p:	2,368	pc/h/ln	

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S):	If $v_p \leq BP$:	FFS_{adj}	*(Eq. 12-1)*		
	If $BP < v_p \leq c$:	$FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_c) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$			
			S:	**n/a**	mi/h
Density (D):		D = v_p / S *(Eq. 12-11)*	D:	**n/a**	pc/mi/ln
Level of Service (LOS):			LOS:	**F**	

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

ADDITIONAL FREEWAY ANALYSIS - FUTURE WITH PROJECT CONDITIONS (YEAR 2035)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Westbound

east of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	15,168	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_c):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 3,309 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): If $v_p \leq BP$: FFS_{adj} *(Eq. 12-1)*

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_c) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **n/a** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* — D: **n/a** pc/mi/ln

Level of Service (LOS): LOS: **F**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

ADDITIONAL FREEWAY ANALYSIS - FUTURE WITH PROJECT CONDITIONS (YEAR 2035)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Eastbound

west of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	16,315	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 3,559 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq BP$: FFS_{adj}

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **n/a** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* — D: **n/a** pc/mi/ln

Level of Service (LOS): LOS: **F**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

ADDITIONAL FREEWAY ANALYSIS - FUTURE WITH PROJECT CONDITIONS (YEAR 2035)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Westbound

west of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	11,941	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 2,605 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq BP$: FFS_{adj}

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **n/a** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* — D: **n/a** pc/mi/ln

Level of Service (LOS): LOS: **F**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

ADDITIONAL FREEWAY ANALYSIS - FUTURE WITH PROJECT CONDITIONS (YEAR 2035)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Eastbound

east of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	16,329	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_c):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 3,562 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): If $v_p \leq BP$: FFS_{adj} *(Eq. 12-1)*

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_c) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **n/a** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* — D: **n/a** pc/mi/ln

Level of Service (LOS): LOS: **F**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

ADDITIONAL FREEWAY ANALYSIS - FUTURE WITH PROJECT CONDITIONS (YEAR 2035)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Westbound

east of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	11,926	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS):	BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*	[	f_{LW}:	0.00	]
		[	f_{RLC}:	0.00	]
			FFS:	52.4	mi/h
Adjusted Free Flow Speed (FFS_{adj}):	FFS x SAF *(Eq. 12-5)*		FFS_{adj}:	52.4	mi/h
Basic Freeway Seg. Capacity (c):	2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)*		c:	2,224	pc/h/ln
Adj. Freeway Seg. Capacity (c_{adj}):	c x CAF *(Eq. 12-8)*		c_{adj}:	2,224	pc/h/ln
Breakpoint (BP):	[1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)*		BP:	1,904	pc/h/ln
Flow Rate (v_p):	$\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*	[	f_{HV}:	0.965	]
			v_p:	2,602	pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): If $v_p \leq BP$: FFS_{adj} *(Eq. 12-1)*

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **n/a** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* D: **n/a** pc/mi/ln

Level of Service (LOS): LOS: **F**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

4051 S Alameda St Add. Cum. Analysis

Vistro File: S:\...\J1673 - 4051 S Alameda St Vistro - Additional RP.vistro

Scenario 1 FB 2035 AM

Report File: S:\...\FB 2035 AM.pdf

12/18/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Alameda St & I-10 EB Ramps	Signalized	HCM 6th Edition	EB Left	0.801	27.2	C
2	Alameda St & 14th/I-10 WB Off-Ramp	Signalized	HCM 6th Edition	SB Right	0.686	35.3	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Alameda St & I-10 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	27.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.801

Intersection Setup

Name	Alameda St			Alameda St			I-10 EB Ramps					
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	1	1	0	0	0	0	0
Pocket Length [ft]	530.00	100.00	100.00	45.00	100.00	330.00	255.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			Yes			Yes			No		

Volumes

Name	Alameda St			Alameda St			I-10 EB Ramps					
Base Volume Input [veh/h]	387	1101	5	1	1044	359	342	0	503	0	0	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	1.00	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	0	0	0	0
Total Hourly Volume [veh/h]	387	1101	5	1	1044	359	342	0	503	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	1.0000	1.0000	1.0000
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]	105	299	1	0	284	98	93	0	137	0	0	0
Total Analysis Volume [veh/h]	421	1197	5	1	1135	390	372	0	547	0	0	0
Presence of On-Street Parking	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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	6	3	0	3	0	0	0
Auxiliary Signal Groups						3,6			3,5			
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	5	5	0	0	5	5	5	0	5	0	0	0
Maximum Green [s]	76	76	0	0	76	76	26	0	26	0	0	0
Amber [s]	3.5	3.5	0.0	0.0	3.5	3.5	3.5	0.0	3.5	0.0	0.0	0.0
All red [s]	0.5	0.5	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.0	0.0	0.0
Split [s]	26	76	0	0	50	50	34	0	34	0	0	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	3.0	3.0	0.0	3.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	5	5	0	5	0	0	0
Pedestrian Clearance [s]	0	11	0	0	11	11	11	0	11	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
Minimum Recall	No	No			No	No	No		No			
Maximum Recall	No	No			No	No	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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	R	
C, Cycle Length [s]	110	110	110	110	110	110	110	110	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00	2.00	0.00	2.00	0.00	
g_i, Effective Green Time [s]	72	72	72	46	46	80	30	56	
g / C, Green / Cycle	0.65	0.65	0.65	0.42	0.42	0.73	0.27	0.51	
(v / s)_i Volume / Saturation Flow Rate	0.51	0.36	0.36	0.00	0.35	0.27	0.23	0.38	
s, saturation flow rate [veh/h]	833	1683	1681	419	3204	1431	1603	1431	
c, Capacity [veh/h]	497	1103	1101	153	1340	1040	436	729	
d1, Uniform Delay [s]	27.25	10.19	10.20	34.44	28.88	5.66	37.98	21.48	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.45	0.34	0.50	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	16.27	1.94	1.95	0.08	6.78	0.94	13.55	7.01	
d3, Initial Queue Delay [s]	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	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.85	0.55	0.55	0.01	0.85	0.38	0.85	0.75	
d, Delay for Lane Group [s/veh]	43.52	12.13	12.14	34.52	35.65	6.59	51.53	28.48	
Lane Group LOS	D	B	B	C	D	A	D	C	
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	
50th-Percentile Queue Length [veh]	6.50	7.56	7.55	0.02	14.16	3.08	11.02	12.16	
50th-Percentile Queue Length [ft]	162.38	188.93	188.87	0.61	354.04	76.96	275.54	303.89	
95th-Percentile Queue Length [veh]	10.68	12.07	12.06	0.04	20.33	5.54	16.47	17.87	
95th-Percentile Queue Length [ft]	266.88	301.64	301.56	1.10	508.34	138.53	411.65	446.84	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	43.52	12.14	12.14	34.52	35.65	6.59	51.53	0.00	28.48	0.00	0.00	0.00
Movement LOS	D	B	B	C	D	A	D		C			
d_A, Approach Delay [s/veh]	20.28			28.23			37.81			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	27.22											
Intersection LOS	C											
Intersection V/C	0.801											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	9.0	9.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	46.37	46.37	0.00
I_p,int, Pedestrian LOS Score for Intersection	0.000	3.051	2.775	0.000
Crosswalk LOS	F	C	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1309	836	0	0
d_b, Bicycle Delay [s]	6.56	18.62	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	2.899	2.819	4.132	4.132
Bicycle LOS	C	C	D	D

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Alameda St & 14th/I-10 WB Off-Ramp

Control Type:	Signalized	Delay (sec / veh):	35.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.686

Intersection Setup

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
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	1	0	1
Pocket Length [ft]	70.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	220.00	100.00	350.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
Base Volume Input [veh/h]	29	1000	58	27	1040	44	41	42	37	566	175	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	0	0	0	0
Total Hourly Volume [veh/h]	29	1000	58	27	1040	44	41	42	37	566	175	74
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]	8	272	16	7	283	12	11	11	10	154	48	20
Total Analysis Volume [veh/h]	32	1087	63	29	1130	48	45	46	40	615	190	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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	45
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	16	0	0	16	0	0	21	0	0	21	0
Amber [s]	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0
Split [s]	0	20	0	0	20	0	0	9	0	0	16	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	11	0	0	11	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	L	C	R
C, Cycle Length [s]	45	45	45	45	45	45	45	45	45	45
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	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	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	16	16	16	16	16	16	5	12	12	12
g / C, Green / Cycle	0.37	0.37	0.37	0.37	0.37	0.37	0.10	0.27	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.07	0.34	0.35	0.07	0.35	0.35	0.08	0.25	0.25	0.06
s, saturation flow rate [veh/h]	428	1683	1651	440	1683	1659	1571	1603	1640	1431
c, Capacity [veh/h]	159	618	606	160	618	609	158	428	438	382
d1, Uniform Delay [s]	22.60	13.82	13.83	22.60	13.98	13.99	19.95	16.19	16.11	12.86
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11
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]	2.81	24.05	24.51	2.47	27.63	28.03	10.57	9.96	8.52	0.27
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	0.20	0.94	0.94	0.18	0.96	0.96	0.83	0.94	0.92	0.21
d, Delay for Lane Group [s/veh]	25.41	37.87	38.33	25.07	41.62	42.02	30.52	26.15	24.63	13.13
Lane Group LOS	C	D	D	C	D	D	C	C	C	B
Critical Lane Group	No	No	No	No	No	Yes	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	0.43	8.41	8.33	0.38	9.17	9.11	1.66	4.55	4.41	0.56
50th-Percentile Queue Length [ft]	10.65	210.21	208.24	9.57	229.19	227.74	41.50	113.82	110.35	14.06
95th-Percentile Queue Length [veh]	0.77	13.16	13.06	0.69	14.13	14.06	2.99	8.05	7.86	1.01
95th-Percentile Queue Length [ft]	19.17	329.10	326.57	17.23	353.32	351.48	74.71	201.30	196.48	25.31

Movement, Approach, & Intersection Results

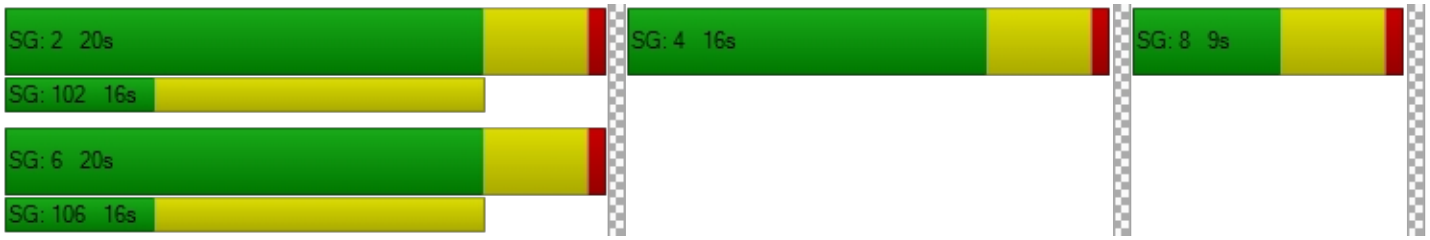
d_M, Delay for Movement [s/veh]	25.41	38.09	38.33	25.07	41.81	42.02	30.52	30.52	30.52	25.62	24.63	13.13
Movement LOS	C	D	D	C	D	D	C	C	C	C	C	B
d_A, Approach Delay [s/veh]	37.76			41.41			30.52			24.28		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	35.27											
Intersection LOS	D											
Intersection V/C	0.686											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	14.40	14.40
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	1.920	2.386
Crosswalk LOS	F	F	A	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	711	711	222	533
d_b, Bicycle Delay [s]	9.34	9.34	17.78	12.10
l_b,int, Bicycle LOS Score for Intersection	2.535	2.555	1.776	3.020
Bicycle LOS	B	B	A	C

Sequence

Ring 1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



4051 S Alameda St Add. Cum. Analysis

Vistro File: S:\...\J1673 - 4051 S Alameda St Vistro - Additional RP.vistro

Scenario 2 FB 2035 PM

Report File: S:\...\FB 2035 PM.pdf

12/19/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Alameda St & I-10 EB Ramps	Signalized	HCM 6th Edition	EB Left	1.087	39.0	D
2	Alameda St & 14th/I-10 WB Off-Ramp	Signalized	HCM 6th Edition	EB Thru	0.782	50.8	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Alameda St & I-10 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	39.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.087

Intersection Setup

Name	Alameda St			Alameda St			I-10 EB Ramps					
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	1	1	0	0	0	0	0
Pocket Length [ft]	530.00	100.00	100.00	45.00	100.00	330.00	255.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			Yes			Yes			No		

Volumes

Name	Alameda St			Alameda St			I-10 EB Ramps					
Base Volume Input [veh/h]	498	1183	0	0	1428	489	183	0	460	0	0	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	1.00	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	0	0	0	0
Total Hourly Volume [veh/h]	498	1183	0	0	1428	489	183	0	460	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	1.0000	1.0000	1.0000
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]	135	321	0	0	388	133	50	0	125	0	0	0
Total Analysis Volume [veh/h]	541	1286	0	0	1552	532	199	0	500	0	0	0
Presence of On-Street Parking	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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	6	3	0	3	0	0	0
Auxiliary Signal Groups						3,6			3,5			
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	5	5	0	0	5	5	5	0	5	0	0	0
Maximum Green [s]	76	76	0	0	76	76	26	0	26	0	0	0
Amber [s]	3.5	3.5	0.0	0.0	3.5	3.5	3.5	0.0	3.5	0.0	0.0	0.0
All red [s]	0.5	0.5	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.0	0.0	0.0
Split [s]	47	126	0	0	79	79	24	0	24	0	0	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	3.0	3.0	0.0	3.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	5	5	0	5	0	0	0
Pedestrian Clearance [s]	0	11	0	0	11	11	11	0	11	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
Minimum Recall	No	No			No	No	No		No			
Maximum Recall	No	No			No	No	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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	R	
C, Cycle Length [s]	150	150	150	150	150	150	150	150	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00	2.00	0.00	2.00	0.00	
g_i, Effective Green Time [s]	122	122	122	75	75	99	20	67	
g / C, Green / Cycle	0.81	0.81	0.81	0.50	0.50	0.66	0.13	0.45	
(v / s)_i Volume / Saturation Flow Rate	0.69	0.38	0.38	0.00	0.48	0.37	0.12	0.35	
s, saturation flow rate [veh/h]	781	1683	1683	386	3204	1431	1603	1431	
c, Capacity [veh/h]	563	1369	1369	191	1601	943	214	640	
d1, Uniform Delay [s]	46.89	4.23	4.23	0.00	36.47	13.86	64.38	35.27	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.24	0.50	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	29.59	1.16	1.16	0.00	16.35	2.44	28.31	9.20	
d3, Initial Queue Delay [s]	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	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.96	0.47	0.47	0.00	0.97	0.56	0.93	0.78	
d, Delay for Lane Group [s/veh]	76.48	5.39	5.39	0.00	52.82	16.30	92.69	44.47	
Lane Group LOS	E	A	A	A	D	B	F	D	
Critical Lane Group	Yes	No	No	No	No	No	No	Yes	
50th-Percentile Queue Length [veh]	8.44	5.30	5.30	0.00	30.34	10.02	9.23	17.14	
50th-Percentile Queue Length [ft]	210.95	132.51	132.51	0.00	758.40	250.45	230.85	428.53	
95th-Percentile Queue Length [veh]	13.20	9.08	9.08	0.00	39.37	15.21	14.22	23.93	
95th-Percentile Queue Length [ft]	330.05	226.90	226.90	0.00	984.22	380.22	355.44	598.27	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	76.48	5.39	5.39	0.00	52.82	16.30	92.69	0.00	44.47	0.00	0.00	0.00
Movement LOS	E	A	A	A	D	B	F		D			
d_A, Approach Delay [s/veh]	26.44			43.49			58.20			0.00		
Approach LOS	C			D			E			A		
d_I, Intersection Delay [s/veh]	38.97											
Intersection LOS	D											
Intersection V/C	1.087											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	9.0	9.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	66.27	66.27	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	3.155	2.936	0.000
Crosswalk LOS	F	C	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1627	1000	0	0
d_b, Bicycle Delay [s]	2.61	18.75	75.00	75.00
l_b,int, Bicycle LOS Score for Intersection	3.067	3.279	4.132	4.132
Bicycle LOS	C	C	D	D

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Alameda St & 14th/I-10 WB Off-Ramp

Control Type:	Signalized	Delay (sec / veh):	50.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.782

Intersection Setup

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
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	1	0	1
Pocket Length [ft]	70.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	220.00	100.00	350.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
Base Volume Input [veh/h]	23	901	31	7	1092	34	56	81	49	677	176	136
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	0	0	0	0
Total Hourly Volume [veh/h]	23	901	31	7	1092	34	56	81	49	677	176	136
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]	6	245	8	2	297	9	15	22	13	184	48	37
Total Analysis Volume [veh/h]	25	979	34	8	1187	37	61	88	53	736	191	148
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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	45
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	16	0	0	16	0	0	21	0	0	21	0
Amber [s]	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0
Split [s]	0	20	0	0	20	0	0	9	0	0	16	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	11	0	0	11	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	L	C	R
C, Cycle Length [s]	45	45	45	45	45	45	45	45	45	45
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	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	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	16	16	16	16	16	16	5	12	12	12
g / C, Green / Cycle	0.36	0.36	0.36	0.36	0.36	0.36	0.11	0.27	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.06	0.30	0.30	0.02	0.37	0.37	0.13	0.29	0.28	0.10
s, saturation flow rate [veh/h]	410	1683	1663	501	1683	1665	1586	1603	1635	1431
c, Capacity [veh/h]	160	603	596	180	603	597	172	428	436	382
d1, Uniform Delay [s]	22.52	13.29	13.29	21.05	14.45	14.45	20.08	16.52	16.52	13.51
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.16	0.15	0.11
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]	2.08	13.56	13.71	0.46	41.60	42.00	92.12	50.75	42.34	0.64
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	0.16	0.84	0.84	0.04	1.02	1.02	1.18	1.08	1.06	0.39
d, Delay for Lane Group [s/veh]	24.60	26.86	27.00	21.51	56.05	56.45	112.20	67.27	58.85	14.15
Lane Group LOS	C	C	C	C	F	F	F	F	F	B
Critical Lane Group	No	No	No	No	No	Yes	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	0.33	5.87	5.83	0.10	11.61	11.55	5.99	9.69	8.87	1.11
50th-Percentile Queue Length [ft]	8.18	146.86	145.72	2.39	290.19	288.78	149.65	242.35	221.72	27.65
95th-Percentile Queue Length [veh]	0.59	9.85	9.79	0.17	17.41	17.34	10.58	15.45	14.21	1.99
95th-Percentile Queue Length [ft]	14.72	246.23	244.71	4.30	435.17	433.60	264.41	386.37	355.24	49.77

Movement, Approach, & Intersection Results

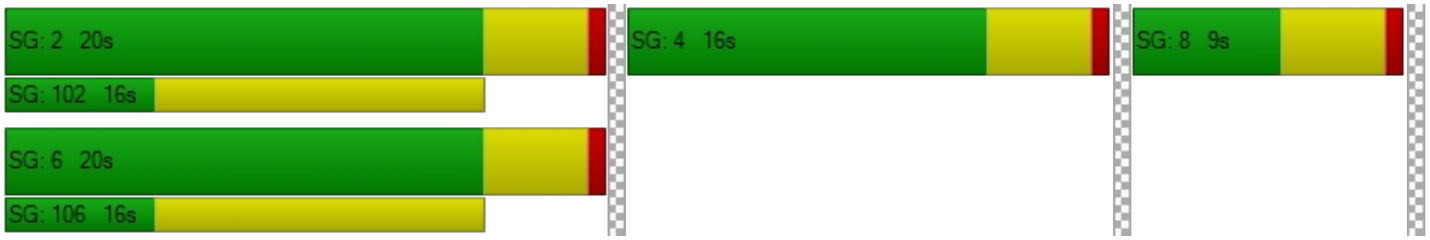
d_M, Delay for Movement [s/veh]	24.60	26.93	27.00	21.51	56.24	56.45	112.20	112.20	112.20	64.15	58.85	14.15
Movement LOS	C	C	C	C	E	E	F	F	F	E	E	B
d_A, Approach Delay [s/veh]	26.87			56.02			112.20			56.33		
Approach LOS	C			E			F			E		
d_I, Intersection Delay [s/veh]	50.78											
Intersection LOS	D											
Intersection V/C	0.782											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	14.40	14.40
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	1.937	2.400
Crosswalk LOS	F	F	A	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	711	711	222	533
d_b, Bicycle Delay [s]	9.34	9.34	17.78	12.10
l_b,int, Bicycle LOS Score for Intersection	2.416	2.576	1.893	3.333
Bicycle LOS	B	B	A	C

Sequence

Ring 1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



4051 S Alameda St Add. Cum. Analysis

Vistro File: S:\...\J1673 - 4051 S Alameda St Vistro - Additional RP.vistro

Scenario 3 FP 2035 AM

Report File: S:\...\FP 2035 AM.pdf

12/18/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Alameda St & I-10 EB Ramps	Signalized	HCM 6th Edition	EB Left	0.820	28.2	C
2	Alameda St & 14th/I-10 WB Off-Ramp	Signalized	HCM 6th Edition	SB Right	0.693	36.0	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Alameda St & I-10 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	28.2
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.820

Intersection Setup

Name	Alameda St			Alameda St			I-10 EB Ramps					
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	1	1	0	0	0	0	0
Pocket Length [ft]	530.00	100.00	100.00	45.00	100.00	330.00	255.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			Yes			Yes			No		

Volumes

Name	Alameda St			Alameda St			I-10 EB Ramps					
Base Volume Input [veh/h]	394	1109	5	1	1064	359	342	0	524	0	0	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	1.00	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	0	0	0	0
Total Hourly Volume [veh/h]	394	1109	5	1	1064	359	342	0	524	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	1.0000	1.0000	1.0000
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]	107	301	1	0	289	98	93	0	142	0	0	0
Total Analysis Volume [veh/h]	428	1205	5	1	1157	390	372	0	570	0	0	0
Presence of On-Street Parking	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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	6	3	0	3	0	0	0
Auxiliary Signal Groups						3,6			3,5			
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	5	5	0	0	5	5	5	0	5	0	0	0
Maximum Green [s]	76	76	0	0	76	76	26	0	26	0	0	0
Amber [s]	3.5	3.5	0.0	0.0	3.5	3.5	3.5	0.0	3.5	0.0	0.0	0.0
All red [s]	0.5	0.5	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.0	0.0	0.0
Split [s]	26	76	0	0	50	50	34	0	34	0	0	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	3.0	3.0	0.0	3.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	5	5	0	5	0	0	0
Pedestrian Clearance [s]	0	11	0	0	11	11	11	0	11	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
Minimum Recall	No	No			No	No	No		No			
Maximum Recall	No	No			No	No	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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	R	
C, Cycle Length [s]	110	110	110	110	110	110	110	110	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00	2.00	0.00	2.00	0.00	
g_i, Effective Green Time [s]	72	72	72	46	46	80	30	56	
g / C, Green / Cycle	0.65	0.65	0.65	0.42	0.42	0.73	0.27	0.51	
(v / s)_i Volume / Saturation Flow Rate	0.52	0.36	0.36	0.00	0.36	0.27	0.23	0.40	
s, saturation flow rate [veh/h]	826	1683	1681	416	3204	1431	1603	1431	
c, Capacity [veh/h]	491	1103	1101	152	1340	1040	436	729	
d1, Uniform Delay [s]	28.51	10.23	10.23	34.61	29.19	5.66	37.98	22.05	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.45	0.34	0.50	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	18.69	1.97	1.97	0.08	7.57	0.94	13.55	8.20	
d3, Initial Queue Delay [s]	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	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.87	0.55	0.55	0.01	0.86	0.38	0.85	0.78	
d, Delay for Lane Group [s/veh]	47.20	12.20	12.21	34.69	36.76	6.59	51.53	30.25	
Lane Group LOS	D	B	B	C	D	A	D	C	
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	
50th-Percentile Queue Length [veh]	6.90	7.64	7.64	0.02	14.70	3.08	11.02	13.15	
50th-Percentile Queue Length [ft]	172.45	190.95	190.90	0.61	367.51	76.96	275.54	328.68	
95th-Percentile Queue Length [veh]	11.21	12.17	12.17	0.04	20.99	5.54	16.47	19.09	
95th-Percentile Queue Length [ft]	280.14	304.26	304.20	1.10	524.71	138.53	411.65	477.34	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	47.20	12.20	12.21	34.69	36.76	6.59	51.53	0.00	30.25	0.00	0.00	0.00
Movement LOS	D	B	B	C	D	A	D		C			
d_A, Approach Delay [s/veh]	21.35			29.16			38.65			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	28.22											
Intersection LOS	C											
Intersection V/C	0.820											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	9.0	9.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	46.37	46.37	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	3.056	2.789	0.000
Crosswalk LOS	F	C	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1309	836	0	0
d_b, Bicycle Delay [s]	6.56	18.62	55.00	55.00
l_b,int, Bicycle LOS Score for Intersection	2.911	2.837	4.132	4.132
Bicycle LOS	C	C	D	D

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Alameda St & 14th/I-10 WB Off-Ramp

Control Type:	Signalized	Delay (sec / veh):	36.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.693

Intersection Setup

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
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	1	0	1
Pocket Length [ft]	70.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	220.00	100.00	350.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
Base Volume Input [veh/h]	29	1000	58	27	1040	44	41	42	37	586	175	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	0	0	0	0
Total Hourly Volume [veh/h]	29	1000	58	27	1040	44	41	42	37	586	175	74
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]	8	272	16	7	283	12	11	11	10	159	48	20
Total Analysis Volume [veh/h]	32	1087	63	29	1130	48	45	46	40	637	190	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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	45
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	16	0	0	16	0	0	21	0	0	21	0
Amber [s]	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0
Split [s]	0	20	0	0	20	0	0	9	0	0	16	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	11	0	0	11	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	L	C	R
C, Cycle Length [s]	45	45	45	45	45	45	45	45	45	45
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	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	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	16	16	16	16	16	16	5	12	12	12
g / C, Green / Cycle	0.37	0.37	0.37	0.37	0.37	0.37	0.10	0.27	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.07	0.34	0.35	0.07	0.35	0.35	0.08	0.26	0.25	0.06
s, saturation flow rate [veh/h]	428	1683	1651	440	1683	1659	1571	1603	1639	1431
c, Capacity [veh/h]	159	618	606	160	618	609	158	428	438	382
d1, Uniform Delay [s]	22.60	13.82	13.83	22.60	13.98	13.99	19.95	16.34	16.25	12.86
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11
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]	2.81	24.05	24.51	2.47	27.63	28.03	10.57	13.58	10.97	0.27
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	0.20	0.94	0.94	0.18	0.96	0.96	0.83	0.96	0.95	0.21
d, Delay for Lane Group [s/veh]	25.41	37.87	38.33	25.07	41.62	42.02	30.52	29.93	27.22	13.13
Lane Group LOS	C	D	D	C	D	D	C	C	C	B
Critical Lane Group	No	No	No	No	No	Yes	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	0.43	8.41	8.33	0.38	9.17	9.11	1.66	5.11	4.83	0.56
50th-Percentile Queue Length [ft]	10.65	210.21	208.24	9.57	229.19	227.74	41.50	127.80	120.77	14.06
95th-Percentile Queue Length [veh]	0.77	13.16	13.06	0.69	14.13	14.06	2.99	8.82	8.44	1.01
95th-Percentile Queue Length [ft]	19.17	329.10	326.57	17.23	353.32	351.48	74.71	220.50	210.89	25.31

Movement, Approach, & Intersection Results

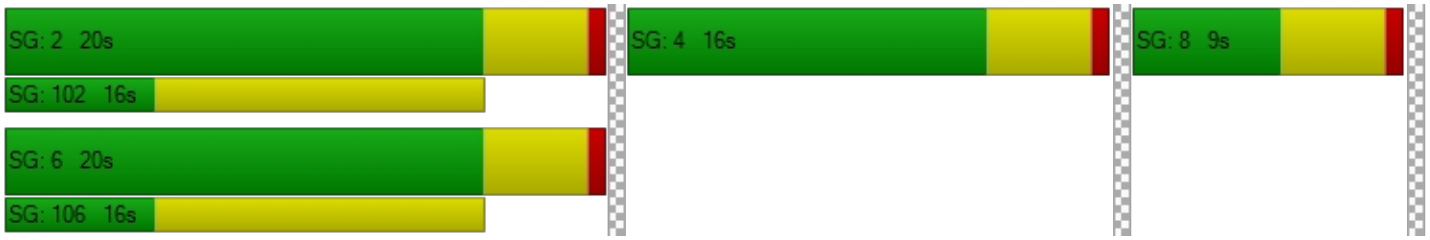
d_M, Delay for Movement [s/veh]	25.41	38.09	38.33	25.07	41.81	42.02	30.52	30.52	30.52	28.97	27.22	13.13
Movement LOS	C	D	D	C	D	D	C	C	C	C	C	B
d_A, Approach Delay [s/veh]	37.76			41.41			30.52			27.21		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	35.98											
Intersection LOS	D											
Intersection V/C	0.693											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	14.40	14.40
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	1.920	2.391
Crosswalk LOS	F	F	A	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	711	711	222	533
d_b, Bicycle Delay [s]	9.34	9.34	17.78	12.10
l_b,int, Bicycle LOS Score for Intersection	2.535	2.555	1.776	3.056
Bicycle LOS	B	B	A	C

Sequence

Ring 1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



4051 S Alameda St Add. Cum. Analysis

Vistro File: S:\...\J1673 - 4051 S Alameda St Vistro - Additional RP.vistro

Scenario 4 FP 2035 PM

Report File: S:\...\FP 2035 PM.pdf

12/19/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Alameda St & I-10 EB Ramps	Signalized	HCM 6th Edition	EB Left	1.135	41.2	D
2	Alameda St & 14th/I-10 WB Off-Ramp	Signalized	HCM 6th Edition	EB Thru	0.784	51.6	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Alameda St & I-10 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	41.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.135

Intersection Setup

Name	Alameda St			Alameda St			I-10 EB Ramps					
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	1	1	0	0	0	0	0
Pocket Length [ft]	530.00	100.00	100.00	45.00	100.00	330.00	255.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			Yes			Yes			No		

Volumes

Name	Alameda St			Alameda St			I-10 EB Ramps					
Base Volume Input [veh/h]	520	1205	0	0	1435	489	183	0	468	0	0	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	1.00	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	0	0	0	0
Total Hourly Volume [veh/h]	520	1205	0	0	1435	489	183	0	468	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	1.0000	1.0000	1.0000
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]	141	327	0	0	390	133	50	0	127	0	0	0
Total Analysis Volume [veh/h]	565	1310	0	0	1560	532	199	0	509	0	0	0
Presence of On-Street Parking	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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	6	3	0	3	0	0	0
Auxiliary Signal Groups						3,6			3,5			
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	5	5	0	0	5	5	5	0	5	0	0	0
Maximum Green [s]	76	76	0	0	76	76	26	0	26	0	0	0
Amber [s]	3.5	3.5	0.0	0.0	3.5	3.5	3.5	0.0	3.5	0.0	0.0	0.0
All red [s]	0.5	0.5	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.0	0.0	0.0
Split [s]	47	126	0	0	79	79	24	0	24	0	0	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	3.0	3.0	0.0	3.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	5	5	0	5	0	0	0
Pedestrian Clearance [s]	0	11	0	0	11	11	11	0	11	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
Minimum Recall	No	No			No	No	No		No			
Maximum Recall	No	No			No	No	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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	R	
C, Cycle Length [s]	150	150	150	150	150	150	150	150	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00	2.00	0.00	2.00	0.00	
g_i, Effective Green Time [s]	122	122	122	75	75	99	20	67	
g / C, Green / Cycle	0.81	0.81	0.81	0.50	0.50	0.66	0.13	0.45	
(v / s)_i Volume / Saturation Flow Rate	0.72	0.39	0.39	0.00	0.49	0.37	0.12	0.36	
s, saturation flow rate [veh/h]	780	1683	1683	378	3204	1431	1603	1431	
c, Capacity [veh/h]	561	1369	1369	186	1601	943	214	640	
d1, Uniform Delay [s]	51.03	4.28	4.28	0.00	36.65	13.86	64.38	35.61	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.24	0.50	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	39.73	1.20	1.20	0.00	17.22	2.44	28.31	9.89	
d3, Initial Queue Delay [s]	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	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	1.01	0.48	0.48	0.00	0.97	0.56	0.93	0.80	
d, Delay for Lane Group [s/veh]	90.76	5.48	5.48	0.00	53.87	16.30	92.69	45.50	
Lane Group LOS	F	A	A	A	D	B	F	D	
Critical Lane Group	Yes	No	No	No	No	No	No	Yes	
50th-Percentile Queue Length [veh]	10.22	5.46	5.46	0.00	30.80	10.02	9.23	17.70	
50th-Percentile Queue Length [ft]	255.61	136.62	136.62	0.00	769.96	250.45	230.85	442.40	
95th-Percentile Queue Length [veh]	15.56	9.30	9.30	0.00	39.90	15.21	14.22	24.59	
95th-Percentile Queue Length [ft]	388.95	232.46	232.46	0.00	997.49	380.22	355.44	614.87	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	90.76	5.48	5.48	0.00	53.87	16.30	92.69	0.00	45.50	0.00	0.00	0.00
Movement LOS	F	A	A	A	D	B	F		D			
d_A, Approach Delay [s/veh]	31.18			44.31			58.76			0.00		
Approach LOS	C			D			E			A		
d_I, Intersection Delay [s/veh]	41.23											
Intersection LOS	D											
Intersection V/C	1.135											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	9.0	9.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	66.27	66.27	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	3.161	2.965	0.000
Crosswalk LOS	F	C	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1627	1000	0	0
d_b, Bicycle Delay [s]	2.61	18.75	75.00	75.00
l_b,int, Bicycle LOS Score for Intersection	3.106	3.286	4.132	4.132
Bicycle LOS	C	C	D	D

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Alameda St & 14th/I-10 WB Off-Ramp

Control Type:	Signalized	Delay (sec / veh):	51.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.784

Intersection Setup

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
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	1	0	1
Pocket Length [ft]	70.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	220.00	100.00	350.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
Base Volume Input [veh/h]	23	901	31	7	1092	34	56	81	49	684	176	136
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	0	0	0	0
Total Hourly Volume [veh/h]	23	901	31	7	1092	34	56	81	49	684	176	136
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]	6	245	8	2	297	9	15	22	13	186	48	37
Total Analysis Volume [veh/h]	25	979	34	8	1187	37	61	88	53	743	191	148
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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	45
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	16	0	0	16	0	0	21	0	0	21	0
Amber [s]	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0
Split [s]	0	20	0	0	20	0	0	9	0	0	16	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	11	0	0	11	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	L	C	R
C, Cycle Length [s]	45	45	45	45	45	45	45	45	45	45
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	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	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	16	16	16	16	16	16	5	12	12	12
g / C, Green / Cycle	0.36	0.36	0.36	0.36	0.36	0.36	0.11	0.27	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.06	0.30	0.30	0.02	0.37	0.37	0.13	0.29	0.29	0.10
s, saturation flow rate [veh/h]	410	1683	1663	501	1683	1665	1586	1603	1635	1431
c, Capacity [veh/h]	160	603	596	180	603	597	172	428	436	382
d1, Uniform Delay [s]	22.52	13.29	13.29	21.05	14.45	14.45	20.08	16.52	16.52	13.51
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.16	0.15	0.11
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]	2.08	13.56	13.71	0.46	41.60	42.00	92.12	54.00	45.45	0.64
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	0.16	0.84	0.84	0.04	1.02	1.02	1.18	1.09	1.07	0.39
d, Delay for Lane Group [s/veh]	24.60	26.86	27.00	21.51	56.05	56.45	112.20	70.52	61.97	14.15
Lane Group LOS	C	C	C	C	F	F	F	F	F	B
Critical Lane Group	No	No	No	No	No	Yes	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	0.33	5.87	5.83	0.10	11.61	11.55	5.99	10.08	9.24	1.11
50th-Percentile Queue Length [ft]	8.18	146.86	145.72	2.39	290.19	288.78	149.65	252.01	231.11	27.65
95th-Percentile Queue Length [veh]	0.59	9.85	9.79	0.17	17.41	17.34	10.58	16.03	14.76	1.99
95th-Percentile Queue Length [ft]	14.72	246.23	244.71	4.30	435.17	433.60	264.41	400.71	369.12	49.77

Movement, Approach, & Intersection Results

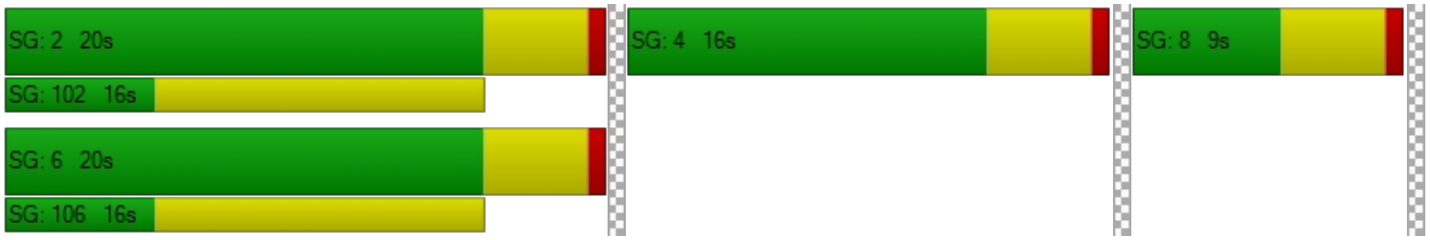
d_M, Delay for Movement [s/veh]	24.60	26.93	27.00	21.51	56.24	56.45	112.20	112.20	112.20	67.34	61.97	14.15
Movement LOS	C	C	C	C	E	E	F	F	F	E	E	B
d_A, Approach Delay [s/veh]	26.87			56.02			112.20			59.12		
Approach LOS	C			E			F			E		
d_I, Intersection Delay [s/veh]	51.64											
Intersection LOS	D											
Intersection V/C	0.784											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	14.40	14.40
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	1.937	2.402
Crosswalk LOS	F	F	A	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	711	711	222	533
d_b, Bicycle Delay [s]	9.34	9.34	17.78	12.10
l_b,int, Bicycle LOS Score for Intersection	2.416	2.576	1.893	3.345
Bicycle LOS	B	B	A	C

Sequence

Ring 1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Appendix B

LADOT Assessment Letters

FORM GEN. 160A (Rev. 1/82)

CITY OF LOS ANGELES

INTER-DEPARTMENTAL CORRESPONDENCE

4051 S. Alameda St
DOT Case No. CEN 12-40373

Date: November 16, 2012

To: Karen Hoo, City Planner
Department of City Planning

From: Tomas Carranza, Senior Transportation Engineer
Department of Transportation

Subject: **TRAFFIC ANALYSIS FOR THE PROPOSED WAREHOUSE PROJECT A 4051 SOUTH ALAMEDA STREET**

The Department of Transportation (DOT) has reviewed the traffic analysis prepared by Traffic Design, Inc., dated September 26, 2012, for the proposed warehouse project located on the southwest corner of Martin Luther King Jr. Boulevard and Alameda Street. Based on DOT's traffic impact criteria[1], the traffic study included the detailed evaluation of seven intersections and determined that none of the study intersections would be significantly impacted by project-related traffic. The results of the traffic analysis, which adequately evaluated the project's traffic impacts on the surrounding community, are summarized in Attachment 1.

DISCUSSION AND FINDINGS

A. Project Description

The project proposes to construct 480,000 square-feet of warehouse space on a site that is currently vacant. The traffic study indicated that there would be 349 parking spaces provided with vehicular access accommodated via four, two-way driveways on Martin Luther King Jr. Boulevard and four, two-way driveways on 41st Street. The project is expected to be completed by 2014.

B. Trip Generation

The project is estimated to generate a net increase of approximately 2,052 daily trips, 173 trips during the a.m. peak hour and 185 trips during the p.m. peak hour. Due to the large number of trucks expected to utilize the facility, the project's trip generation numbers were inflated using a passenger car equivalent factor to estimate project truck traffic. A copy of the trip generation table from the traffic study can be found in Attachment 2.

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[1] Per the DOT Traffic Study Policies and Procedures, a significant impact is identified as an increase in the Critical Movement Analysis (CMA) value, due to project related traffic, of 0.01 or more when the final ("with project") Level of Service (LOS) is LOS E or F; an increase of 0.020 or more when the final LOS is LOS D; or an increase of 0.040 or more when the final LOS is LOS C.

PROJECT REQUIREMENTS

A. Construction Impacts

DOT recommends that a construction work site traffic control plan be submitted to DOT for review and approval prior to the start of any construction work. The plan should show the location of any roadway or sidewalk closures, traffic detours, haul routes, hours of operation, protective devices, warning signs and access to abutting properties. DOT also recommends that all construction related traffic be restricted to off-peak hours.

B. Highway Dedication And Street Widening Requirements

As part of the Southeast Los Angeles Community Plan update process, the Department of City Planning and DOT evaluated the current street designations within the community plan area to develop revised street standards that provide an enhanced balance between traffic flow and other important street functions including transit routes and stops, pedestrian environments, bicycle routes, building design and site access, etc. Although the Southeast Los Angeles Community Plan Update has not yet been adopted, DOT recommends that the proposals in the plan be included in the highway dedication and widening requirements for this project.

The updated community plan recommends that 41st Street be reclassified to a Collector Street. The plan does not recommend redesignations for the other roadways along the project's frontage (Alameda Street, Long Beach Boulevard and Martin Luther King, Jr. Boulevard). Alameda Street, and Long Beach Avenue are classified as Major Highways Class II and Martin Luther King Jr. Boulevard is classified as a Local Street. According to the standard street dimensions of the Department of Public Works, Bureau of Engineering (BOE), a Major Highway Class II requires a 40-foot half-width roadway within a 52-foot half-width right-of-way, a Collector Street requires a 22-foot half-width roadway within a 32-foot half-width right-of-way and a Local Street requires a 20-foot half-width roadway within a 30-foot half-width right-of-way. The applicant should check with BOE's Land Development Group to determine if there are any highway dedication, street widening and/or sidewalk requirements for this project.

C. Parking Requirements

The traffic study indicated that 185 parking spaces will be provided. The developer should check with the Department of Building and Safety on the number of Code-required parking spaces needed for the project.

D. Driveway Access and Circulation

The conceptual site plan for the project is illustrated in Attachment 3. The review of this study does not constitute approval of the driveway dimensions, access and circulation scheme. Those require separate review and approval and should be coordinated as soon as possible with DOT's Citywide Planning Coordination Section (201 N. Figueroa Street, 4th Floor, Station 3, @ 213-482-7024) to avoid

delays in the building permit approval process. In order to minimize and prevent last minute building design changes, it is highly imperative that the applicant, prior to the commencement of building or parking layout design efforts, contact DOT for driveway width and internal circulation requirements so that such traffic flow considerations are designed and incorporated early into the building and parking layout plans to avoid any unnecessary time delays and potential costs associated with late design changes. All driveways should be Case 2 driveways and 30 feet and 16 feet wide for two-way and one-way operations, respectively. All delivery truck loading and unloading will take place on site with no vehicles having to back into the project via any of the project driveways.

E. Development Review Fees

An ordinance adding Section 19.15 to the Los Angeles Municipal Code relative to application fees paid to the Department of Transportation for permit issuance activities was adopted by the Los Angeles City Council. Ordinance No. 180542, effective March 28, 2009, identifies specific fees for traffic study review, condition clearance, and permit issuance. The applicant shall comply with any applicable fees per this ordinance.

If you have any questions, please contact Wes Pringle of my staff at (213) 972-8482.

Letters\CEN12-40373_4051 alameda warehouse ts ltr.wpd

c: Stephanie Magnien, Council District No. 9
Mehrdad Moshksar, Central District, DOT
Taimour Tanavoli, Citywide Planning Coordination Section, DOT
Carl Mills, Central District, BOE
M. Yunus Rahi, Traffic Design Incorporated

TABLE 8
EXISTING 2012 AND FUTURE 2014 LEVEL OF SERVICE SUMMARY WITH AND WITHOUT PROJECT

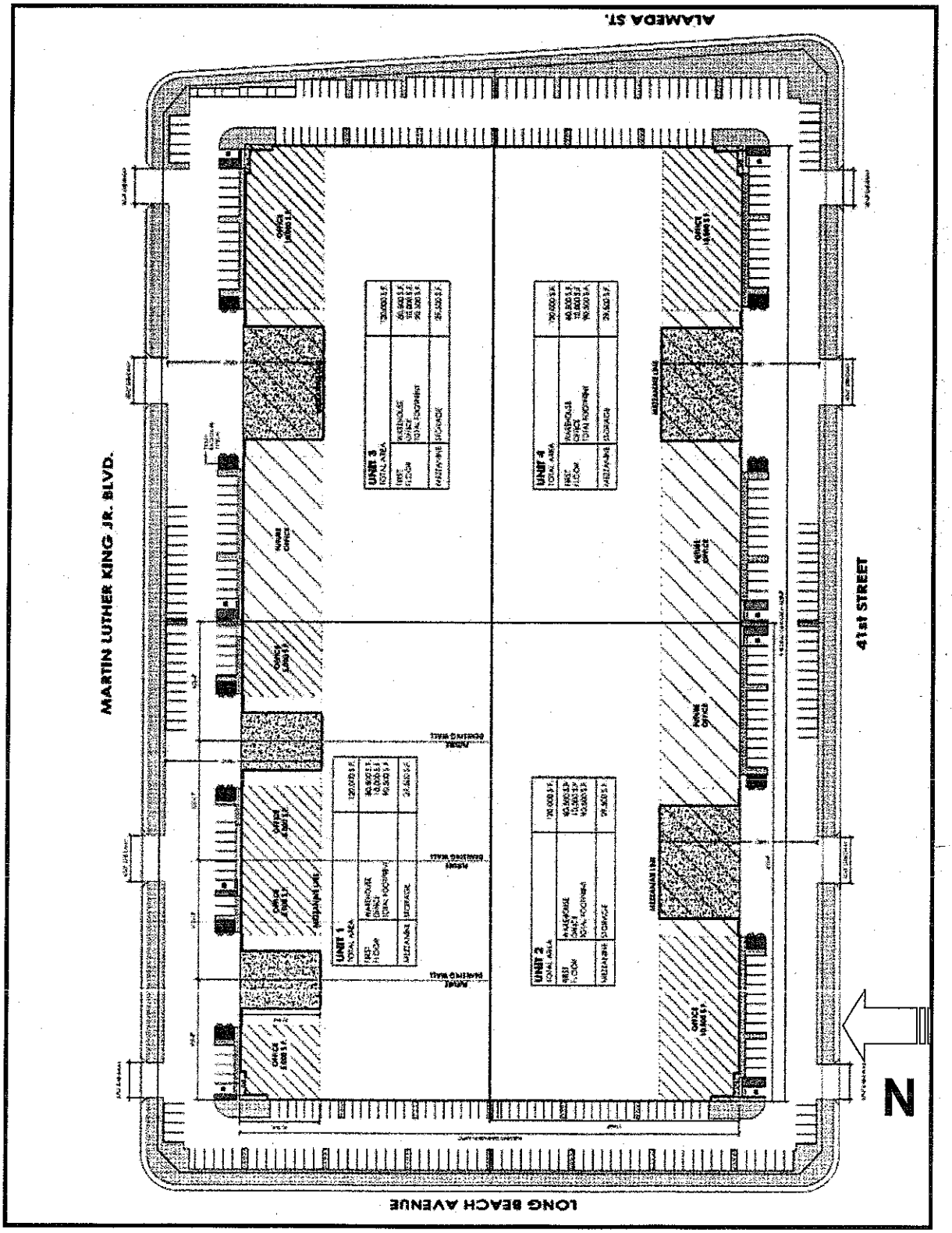
Intersection	Peak Hour	Existing 2012 Conditions				Future 2014 Conditions				Increase in V/C Ratio by Project
		Without Project		With Project		Without Project		With Project		
		LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	
1. Alameda Street and 41st Street	AM	A	0.412	A	0.433	A	0.434	A	0.455	0.021
	PM	A	0.365	A	0.419	A	0.374	A	0.428	0.054
2. Alameda Street and Vernon Avenue	AM	B	0.656	B	0.675	B	0.675	B	0.694	0.019
	PM	B	0.637	B	0.645	B	0.654	B	0.662	0.008
3. Alameda Street and 24th Street	AM	A	0.569	A	0.575	A	0.597	A	0.603	0.006
	PM	B	0.654	B	0.670	B	0.672	B	0.688	0.016
4. Alameda Street and Washington Boulevard	AM	D	0.826	D	0.841	D	0.845	D	0.860	0.015
	PM	D	0.849	D	0.864	D	0.869	D	0.884	0.015
5. Long Beach Avenue and 41st Street	AM	A	0.571	B	0.607	A	0.592	B	0.629	0.037
	PM	B	0.637	B	0.662	B	0.652	B	0.677	0.025
6. Long Beach Avenue and Vernon Avenue	AM	B	0.647	B	0.667	B	0.665	B	0.685	0.020
	PM	A	0.420	A	0.427	A	0.431	A	0.438	0.007
7. Long Beach Avenue and 24th Street	AM	A	0.425	A	0.427	A	0.448	A	0.449	0.001
	PM	B	0.686	B	0.693	C	0.705	C	0.712	0.007

TABLE 5
TRIP GENERATION BY 4051 S. ALAMEDA STREET ALAMEDA INDUSTRIAL PARK WAREHOUSING PROJECT

ITE Code	Size & Unit	Trip Generation Rate							Average Traffic Volume						
		Daily Total	AM Peak Hour			PM Peak Hour			Daily Total	AM Peak Hour			PM Peak Hour		
			Total	%IN	%OUT	Total	%IN	%OUT		IN	OUT	Total	IN	OUT	Total
TOTAL VEHICLE TRIP GENERATION															
150	480,000 GSF	3.56	0.30	79	21	0.32	25	75	1,710	114	30	144	38	115	154
TRUCK TRIP GENERATION (20% OF VEHICULAR TRIPS)															
Truck Trips									342	23	6	29	8	23	31
PASSENGER CAR EQUIVALENT (PCE) TRIP GENERATION															
Trucks in PCE (1 Truck = 2 Passenger Cars)									684	46	12	58	16	46	62
Non-truck (Passenger Car Equivalent) Trips									1,368	91	24	115	31	92	123
Net New Trips in PCE									2,052	137	36	173	47	138	185

Note: All trip rates are average rates
Ref: Institute of Transportation Engineers (ITE)'s "Trip Generation". 8th Edition, 2007

Figure 7: PROJECT SITE PLAN



FORM GEN. 160A (Rev. 1/82)

CITY OF LOS ANGELES

INTER-DEPARTMENTAL CORRESPONDENCE

4051 S. Alameda St
DOT Case No. CEN 12-40373

Date: February 4, 2013

To: Karen Hoo, City Planner
Department of City Planning

From: Tomas Carranza, Senior Transportation Engineer
Department of Transportation

Subject: **REVISED TRAFFIC IMPACT ANALYSIS FOR THE PROPOSED WAREHOUSE PROJECT AT 4051 SOUTH ALAMEDA STREET**

The Department of Transportation (DOT) has reviewed the supplemental traffic analysis, dated January 15, 2013, and prepared by Traffic Design, Inc., for the revised warehouse project located on the southwest corner of Martin Luther King Jr. Boulevard and Alameda Street. The original project scope was the subject of a traffic study prepared in September 26, 2012 and of a DOT report dated November 16, 2012. Previously, the project proposed a 480,000 square-foot warehouse. The project has been revised and now proposes to construct a 497,219 square-foot warehouse. The number of parking spaces provided will also be increased by 11 spaces for a total of 399 spaces.

The supplemental analysis indicates that the change in the project's scope would not result in any significant traffic impacts and that DOT's original findings are still valid. According to the traffic impact study from September 26, 2012, the original project was not expected to result in any significant traffic impacts at the seven intersections identified for detailed analysis. The revised project is estimated to generate 2,112 net new daily trips, 178 net new trips in the a.m. peak hour and 190 net new trips in the p.m. peak hour. The revised project's trip generation represents an increase to the original trip generation. The revised analysis evaluated the original seven study intersections and determined that none of the study intersections would be significantly impacted by the update project related traffic estimates. The supplemental traffic analysis adequately evaluated the revised project's impacts on the surrounding community.

DOT concurs with the findings of the supplemental traffic analysis. **All of the project requirements that are identified in DOT's original letter, dated November 16, 2012 (attached for reference), should remain in effect.**

If you have any questions, please contact Wes Pringle of my staff at (213) 972-8482.

s:\letters\CEN12-40373_4051 alameda warehouse_rev proj.wpd

Attachment (DOT Project Assessment Report dated November 16, 2012)

c: Stephanie Magnien, Council District No. 9
Mehrdad Moshksar, Central District, DOT
Taimour Tanavoli, Citywide Planning Coordination Section, DOT
Carl Mills, Central District, BOE
M. Yunus Rahi, Traffic Design Incorporated

FORM GEN. 160A (Rev. 1/82)

CITY OF LOS ANGELES

INTER-DEPARTMENTAL CORRESPONDENCE

4051 S. Alameda St
DOT Case No. CEN 12-40373

Date: October 4, 2013

To: Karen Hoo, City Planner
Department of City Planning

From: Tomas Carranza, Senior Transportation Engineer
Department of Transportation

Subject: **TRAFFIC ASSESSMENT FOR THE PROPOSED WAREHOUSE PROJECT AT 4051 SOUTH ALAMEDA STREET**

On November 16, 2012 and February 4, 2013, the Department of Transportation issued traffic assessment reports to the Department of City Planning on the proposed warehouse project located at 4051 South Alameda Street. However, since these reports were released, the applicant has modified the project and a supplemental traffic impact analysis was submitted. Therefore, DOT resubmits the traffic impact assessment report in its entirety. Please replace the two previous DOT assessments with this report.

The Department of Transportation (DOT) has reviewed the supplemental traffic analysis, dated September 15, 2013, and prepared by Traffic Design, Inc., for the proposed warehouse project located on the southwest corner of Martin Luther King Jr. Boulevard and Alameda Street. The original study, dated September 26, 2012, and the revised analysis evaluated seven intersections and determined that, based on DOT's current traffic impact criteria[1], there would be no significant impacts at the studied intersections. The results of the revised traffic impact analysis are summarized in **Attachment 1**. Except as noted, the supplemental traffic analysis adequately evaluated the revised project's impacts on the surrounding community.

DISCUSSION AND FINDINGS

1. Project Description

   The project proposes to construct 467,323 square-feet of warehouse space and 29,896 square-feet of manufacturing. This revised proposal is expected to result in project trip generation estimates that are slightly more than the original project proposal. Vehicular access would be provided via four, two-way driveways on Martin Luther King Jr. Boulevard and four, two-way driveways on 41st Street. The revised analysis did not indicate if there would be any changes to the number of parking spaces that were originally proposed. The project is expected to be completed by 2014.

[1] Per the DOT Traffic Study Polices and Procedures, a significant impact is identified as an increase in the Critical Movement Analysis (CMA) value, due to project related traffic, of 0.010 or more when the final ("with project") Level of Service (LOS) is LOS E or F; an increase of 0.020 or more when the final LOS is LOS D; or an increase of 0.040 or more when the final LOS is LOS C.

2. Trip Generation
The project is estimated to generate approximately 2,134 net new daily trips, 194 net trips in the a.m. peak hour and 205 net trips in the p.m. peak hour. A copy of the trip generation table from the traffic study can be found in **Attachment 2**.

PROJECT REQUIREMENTS

1. Construction Impacts
DOT recommends that a construction work site traffic control plan be submitted to DOT for review and approval prior to the start of any construction work. The plan should show the location of any roadway or sidewalk closures, traffic detours, haul routes, hours of operation, protective devices, warning signs and access to abutting properties. DOT also recommends that all construction related traffic be restricted to off-peak hours.

2. Highway Dedication And Street Widening Requirements
As part of the Southeast Los Angeles Community Plan update process, the Department of City Planning and DOT evaluated the current street designations within the community plan area to develop revised street standards that provide an enhanced balance between traffic flow and other important street functions including transit routes and stops, pedestrian environments, bicycle routes, building design and site access, etc. Although the Southeast Los Angeles Community Plan Update has not yet been adopted, DOT recommends that the proposals in the plan be included in the highway dedication and widening requirements for this project.

The updated community plan recommends that 41st Street be reclassified to a Collector Street. The plan does not recommend redesignations for the other roadways along the project's frontage (Alameda Street, Long Beach Boulevard and Martin Luther King, Jr. Boulevard). Alameda Street, and Long Beach Avenue are classified as Major Highways Class II and Martin Luther King Jr. Boulevard is classified as a Local Street. According to the standard street dimensions of the Department of Public Works, Bureau of Engineering (BOE), a Major Highway Class II requires a 40-foot half-width roadway within a 52-foot half-width right-of-way, a Collector Street requires a 22-foot half-width roadway within a 32-foot half-width right-of-way and a Local Street requires a 20-foot half-width roadway within a 30-foot half-width right-of-way. The applicant should check with BOE's Land Development Group to determine if there are any highway dedication, street widening and/or sidewalk requirements for this project.

3. Parking Analysis
As noted previously, the revised analysis did not indicate the total number of parking spaces to be provided. The applicant should check with the Department of Building and Safety on the number of Code required parking spaces needed for the project.

4. Driveway Access
The proposed site plan as illustrated in **Attachment 3** is acceptable to DOT. However, the review of this study does not constitute approval of the driveway access and circulation scheme. Those require separate review and approval and should be coordinated with DOT's Citywide Planning Coordination Section (201 N. Figueroa Street, 4th Floor, Station 3, @ 213-482-7024). In order to minimize and prevent last minute building design changes, the applicant should contact DOT for driveway width and internal circulation requirements so that such traffic flow considerations are designed and incorporated early into the building and parking layout plans. All driveways should be Case 2 driveways and 30 feet and 18 feet wide for two-way and one-way operations, respectively.

5. Development Review Fees
An ordinance adding Section 19.15 to the Los Angeles Municipal Code relative to application fees paid to DOT for permit issuance activities was adopted by the Los Angeles City Council in 2009. This ordinance identifies specific fees for traffic study review, condition clearance, and permit issuance. The applicant shall comply with any applicable fees per this new ordinance.

If you have any questions, please contact Wes Pringle of my staff at (213) 972-8482.

Attachments

s:\letters\CEN12-40373_4051 alameda_rev2 proj.wpd

c: Rob Katherman, Council District No. 9
Mehrdad Moshksar, Central District, DOT
Taimour Tanavoli, Citywide Planning Coordination Section, DOT
Carl Mills, Central District, BOE
M. Yunus Rahi, Traffic Design Inc.

TABLE 2
EXISTING 2012 AND FUTURE 2014 LEVEL OF SERVICE SUMMARY WITH AND WITHOUT PROJECT

Intersection	Peak Hour	Existing 2012 Conditions				Future 2014 Conditions				Increase in V/C Ratio by Project
		Without Project		With Project		Without Project		With Project		
		LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	
1. Alameda Street and 41st Street	AM	A	0.412	A	0.433	A	0.434	A	0.457	0.023
	PM	A	0.365	A	0.419	A	0.374	A	0.434	0.060
2. Alameda Street and Vernon Avenue	AM	B	0.656	B	0.675	B	0.675	B	0.696	0.021
	PM	B	0.637	B	0.645	B	0.654	B	0.663	0.009
3. Alameda Street and 24th Street	AM	A	0.569	A	0.575	A	0.597	A	0.603	0.006
	PM	B	0.654	B	0.670	B	0.672	B	0.691	0.019
4. Alameda Street and Washington Boulevard	AM	D	0.826	D	0.841	D	0.845	D	0.862	0.017
	PM	D	0.849	D	0.864	D	0.869	D	0.886	0.017
5. Long Beach Avenue and 41st Street	AM	A	0.571	B	0.607	A	0.592	B	0.632	0.040
	PM	B	0.637	B	0.662	B	0.652	B	0.678	0.026
6. Long Beach Avenue and Vernon Avenue	AM	B	0.647	B	0.667	B	0.665	B	0.686	0.021
	PM	A	0.420	A	0.427	A	0.431	A	0.440	0.009
7. Long Beach Avenue and 24th Street	AM	A	0.425	A	0.427	A	0.448	A	0.449	0.001
	PM	B	0.686	B	0.693	C	0.705	C	0.713	0.008

Attachment 2

4051 S. Alameda St

TABLE 1

TRIP GENERATION FOR
WAREHOUSING (ITE 8TH Edition AVERAGE RATES)
(ORIGINAL PROJECT LAND USE)

ITE Code	Size & Unit	Trip Generation Rate							Average Traffic Volume						
		Daily Total	AM Peak Hour			PM Peak Hour			Daily Total	AM Peak Hour			PM Peak Hour		
			Total	%IN	%OUT	Total	%IN	%OUT		IN	OUT	Total	IN	OUT	Total
150	480,000 GSF	3.56	0.30	79	21	0.32	25	75	1,709	114	30	144	38	115	154

Note: All trip rates are average rates
[Ref: Institute of Transportation Engineers (ITE)'s "Trip Generation", 8th Edition, 2007]

Truck Traffic Generation: 20% of vehicular trips per ITE 8th Edition:

150	480,000 GSF	0.71	0.06	79	21	0.06	25	75	342	23	6	29	8	23	31

Trucks in PCE (1 Truck = 2 Passenger cars)	684	46	12	58	16	46	62
Other Vehicles	1,367	91	24	115	31	92	123
Total in PCE	2,052	137	36	173	47	138	185

TRIP GENERATION FOR
WAREHOUSING AND MANUFACTURING (ITE 8TH Edition AVERAGE RATES)
(PROPOSED MODIFIED LAND USE)

ITE Code	Size & Unit	Trip Generation Rate							Average Traffic Volume						
		Daily Total	AM Peak Hour			PM Peak Hour			Daily Total	AM Peak Hour			PM Peak Hour		
			Total	%IN	%OUT	Total	%IN	%OUT		IN	OUT	Total	IN	OUT	Total
150	467,323 GSF	3.56	0.30	79	21	0.32	25	75	1,664	111	29	140	37	112	150
140	29,896 GSF	3.82	0.73	78	.22	0.73	36	64	114	17	5	22	8	14	22

Note: All trip rates are average rates
[Ref: Institute of Transportation Engineers (ITE)'s "Trip Generation", 8th Edition, 2007]

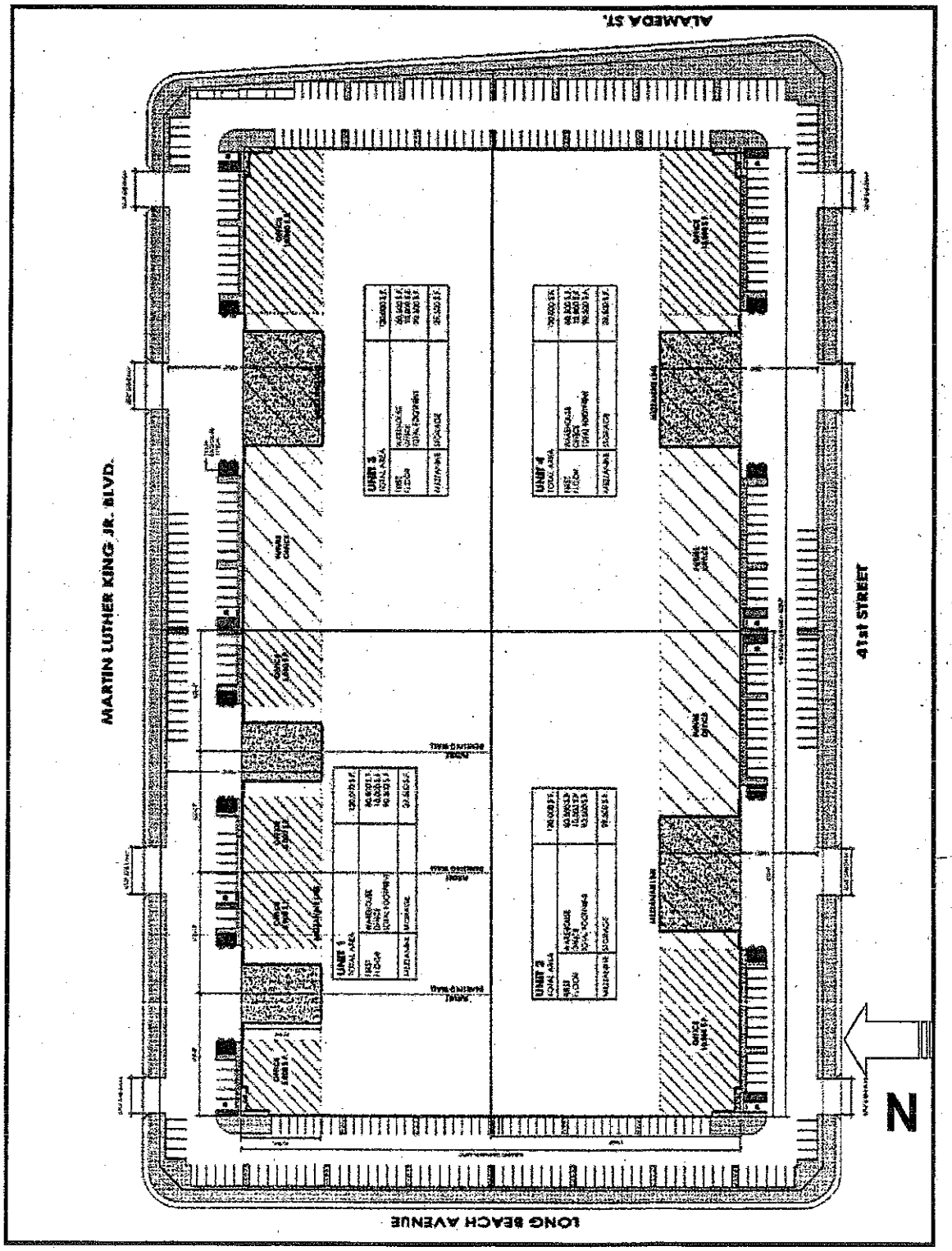
Truck Traffic Generation: 20% of vehicular trips per ITE 8th Edition:

Warehousing and Manufacturing	356	26	7	32	9	25	34

Trucks in PCE (1 Truck = 2 Passenger cars)	711	51	14	65	18	50	69
Other Vehicles	1,422	102	27	130	36	101	137
Total in PCE	2,134	153	41	194	54	151	205

DIFFERENCE IN PCE TRIPS DUE TO MODIFIED LAND USE	84	16	5	21	7	13	20

Figure 7: PROJECT SITE PLAN



Appendix C

Caltrans Comment Letters

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY

EDMUND G. BROWN, JR., Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 7, TRANSPORTATION PLANNING
IGR/CEQA BRANCH
100 MAIN STREET, MS # 16
LOS ANGELES, CA 90012-3606
PHONE: (213) 897-9140
FAX: (213) 897-1337

Flex your power!
Be energy efficient!

July 14, 2014

Ms. Srimal Hewawitharana
City of Los Angeles
200 N. Spring Street, Room 750
Los Angeles, CA 90012

IGR/CEQA No. 140621AL-NOP
4051 South Alameda Street Project
Vic. LA-10, PM 17.122
SCH # 2014061030

Dear Ms. Hewawitharana:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above referenced project. The proposed warehouse project consists of constructing a warehousing facility with 4 units totaling 480,000 square feet gross floor area including ancillary office spaces.

In Caltrans' Guide for the Preparation of Traffic Impact Studies, December 2002, "The level of service (LOS) for operating State highway facilities is based upon measures of effectiveness (MOEs). Caltrans endeavors to maintain a target LOS at the transition between LOS 'C' and LOS 'D' on State highway facilities. If an existing State highway facility is operating at less than the appropriate target LOS, the existing MOE should be maintained." The surrounding freeway 10 is operating near or at capacity during the peak hours at this time.

The project will generate a net total of approximately 2,052 new two-way passenger car equivalent trips per day with 173/185 AM/PM peak hour trips. However, trip generation needs to include employee trips. In addition, there are 1,021/171 AM/PM cumulative peak hour trips. Based on the traffic data received, when the related projects are built, there may be a significant cumulative traffic impact to the State facilities.

In addition, the Traffic Impact Study (TIS) did not include a traffic analysis of the State facilities. According to the TIS, all project related truck trips will use the State facilities; therefore, Caltrans is requesting additional analysis focusing on the following locations and information:

1. 2012 traffic conditions at I-10 and on/off ramps to/from Alameda Street,
2. Project trips assignments to I-10 and on/off ramps,
3. Project opening year (2014) traffic conditions for level of service (LOS) with and without the project,
4. Traffic mitigation measures to reduce any significant impacts to a level of insignificance.

ENV-2012-920-4367

5. An analysis of the off-ramps in the project vicinity should utilize the Higheway Capacity Manual (HCM) 85th percentile queuing methodology with the actual signal timing at the ramps' termini.

To assist in evaluating the impacts of this project on State transportation facilities, an additional traffic study should be prepared prior to preparing the Draft Environmental Impact Report (DEIR). Please refer the project's traffic consultant to Caltrans' traffic study guide Website:

http://www.dot.ca.gov/hq/tpp/offices/ocp/igr_ceqa_files/tisguide.pdf

We look forward to reviewing the traffic study and expect to receive a copy from the State Clearinghouse when the DEIR is completed. Should you wish to expedite the review process or receive early feedback from the Caltrans please feel free to send a copy of the DEIR directly to our office.

If you have any questions, please feel free to contact Mr. Alan Lin the project coordinator at (213) 897-8391 and refer to IGR/CEQA No. 140621AL.

Sincerely,

DIANNA WATSON
IGR/CEQA Branch Chief

cc: Scott Morgan, State Clearinghouse

DEPARTMENT OF TRANSPORTATION
DISTRICT 7-OFFICE OF TRANSPORTATION PLANNING
100 S. MAIN STREET, MS 16
LOS ANGELES, CA 90012
PHONE (213) 897-9140
FAX (213) 897-1337
www.dot.ca.gov

Serious drought.
Help save water!

February 19, 2015

Ms. Srimal Hewawitharana
City of Los Angeles
200 North Spring Street, Room 750
Los Angeles, CA 90012

RE: 4051 South Alameda Street Project
Vic. LA-10/ PM 17.122
SCH # 2014061030
Ref. IGR/CEQA No. 140621AL-NOP
IGR/CEQA No. 150141AL-DEIR

Dear Ms. Hewawitharana:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above referenced project. The proposed project includes the construction of a new industrial park consisting of four warehousing facility buildings totaling 480,000 square feet gross floor area including ancillary office spaces.

Attached please find Caltrans letter prepared on July 14, 2014. In the Draft Environmental Impact Report (DEIR) prepared in January 2015 and in the Appendix IS-5 Traffic Impact Study (TIS) prepared on September 26, 2012, Caltrans traffic concerns have not been addressed. B1-1

Again, the TIS did not include a traffic analysis of the State's highway facilities. There are 1,021/171 AM/PM cumulative peak hour trips. In addition, the SOLA Village Project, a mixed use project consisting of 2.53 million square feet of development, is a few blocks away from the project site. Based on the size of the both of these projects, a significant cumulative traffic impact to the State facilities may occur. B1-2 B1-3

As a reminder, in Caltrans' Guide "The level of service (LOS) for operating State highway facilities is based upon measures of effectiveness (MOEs). Caltrans endeavors to maintain a target LOS at the transition between LOS 'C' and LOS 'D' on State highway facilities. If an existing State highway facility is operating at less than the appropriate target LOS, the existing MOE should be maintained." The existing LOS on the freeway should be disclosed regardless of how many trips will be assigned to the highway. Currently the LOS on I-10 and I-110 are B1-4

operating at or near capacity during peak hours. Additional vehicle trips from the project or related projects may contribute significant impacts to the I-10 and I-110. The decision makers should be aware of this issue and be prepared to mitigate cumulative traffic impacts in the future. B1-4 Cnt'd

In the spirit of mutual cooperation, we encourage the City to work with Caltrans in an effort to evaluate traffic impacts, identify potential improvements, and establish a funding mechanism that helps mitigate cumulative transportation impacts in the area. B1-5

If you have any questions, please feel free to contact Alan Lin the project coordinator at (213) 897-8391 and refer to IGR/CEQA No. 150141AL-DEIR.

Sincerely,

Rick Holland

RICK HOLLAND
Acting Branch Chief
Community Planning & LD / IGR Review

cc: Scott Morgan, State Clearinghouse

B. STATE AGENCIES

LETTER NO. B1

California Department of Transportation
Rick Holland, Acting Branch Chief, Community Planning & LD/IGR Review
District 7 Office of Transportation and Planning
100 S. Main Street, MS 16
Los Angeles, CA 90012

COMMENT NO. B1-1

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above referenced project. The proposed project includes the construction of a new industrial park consisting of four warehousing facility buildings totaling 480,000 square feet gross floor area including ancillary office spaces.

Attached please find Caltrans letter prepared on July 14, 2014. In the Draft Environmental Impact Report (DEIR) prepared in January 2015 and in the Appendix IS-5 Traffic Impact Study (TIS) prepared on September 26, 2012, Caltrans traffic concerns have not been addressed.

RESPONSE NO. B1-1

The City of Los Angeles (City) has noted the reference to concerns raised in Caltrans' July 14, 2014 letter. The concerns raised in the July 14, 2014 letter are addressed below.

Regarding the necessity of a traffic analysis of the State's highway facilities, the traffic analysis was conducted per scope of study identified in a memorandum of understanding (MOU) signed in consultation with the City of Los Angeles Department of Transportation (LADOT). Since the proposed project site is entirely within the jurisdiction of the City, LADOT requires the traffic study to follow the guidelines established in its "Traffic Study Policies and Procedures" document. The most recent version of the guidelines, dated August 2014, includes a section that addresses the need for analysis of State highway facilities. The following is an excerpt from LADOT guidelines relevant to State highway facilities (refer to Section E, page 8 of Traffic Study Policies and Procedures, which is included as Appendix B of the Final EIR):

> *FREEWAY IMPACT ANALYSIS SCREENING CRITERIA*
>
> *Pursuant to the Freeway agreement executed in October 2013 between LADOT and Caltrans District 7, traffic studies may be required to conduct a focused freeway impact analysis in addition to the CMP analysis described above. If the proposed project meets any of the following criteria, the applicant will be directed to the Caltrans' Intergovernmental Review section for a determination on the need for analysis and, if necessary, the methodology to be utilized for a freeway impact analysis:*
>
> - *The project's peak hour trips would result in a 1-percent or more increase to the freeway mainline capacity of a freeway segment operating at LOS E or F (based on an assumed capacity of 2,000 vehicles per hour per lane); or*
> - *The project's peak hour trips would result in a 2-percent or more increase to the freeway mainline capacity of a freeway segment operating at LOS D (based on an assumed capacity of 2,000 vehicles per hour per lane); or*

- *The project's peak hour trips would result in a 1-percent or more increase to the freeway mainline capacity of a freeway off-ramp operating at LOS E or F, based on an assumed ramp capacity of 1,500 vehicles per hour per lane); or*
- *The project's peak hour trips would result in a 2-percent or more increase to the freeway mainline capacity of a freeway off-ramp operating at LOS D, based on an assumed ramp capacity of 1,500 vehicles per hour per lane).*

Accordingly, the proposed project's traffic study and existing conditions section on freeway segment analysis included an analysis of the proposed project's estimated trip generation and distribution, existing traffic counts, lane configuration and level of service (LOS). Information for freeway segment and ramp intersections was analyzed to determine if the proposed project meets the agreed upon criteria in order to proceed with freeway impact analysis using the Caltrans Guide for the Preparation of Traffic Impact Studies (latest version, December 2002, which is included as Appendix C to the Final EIR). The freeway segments of I-10 EB (East of Alameda Street, and West of Alameda Street) as well as I-10 WB (East of Alameda Street, and West of Alameda Street) were analyzed. The results of this analysis indicated that the proposed project does not meet any of the criteria requiring a freeway impact analysis. At freeway LOS E or F, project trips must increase freeway peak hour volume by 100 in either direction (i.e., 1 percent of 5-lane freeway capacity, 10,000 vehicles per hour). The existing I-10 Freeway segments in the study area are operating at LOS F. The project contributes a maximum of 22 trips in both EB and WB direction of the freeway (Table IV G.3, p. IV.G-8 of the Draft EIR) during the peak hour, which is less than the 100 trips threshold requiring additional impact analysis.

The comments raised in the NOP letter on July 14, 2014, concerning cumulative traffic impacts are addressed in the Draft EIR Section IV.G Traffic, page IV.G-17, and in the Traffic Impact Study (Appendix III IS-5 of the Draft EIR, pages 22 through 24, and Addendum to Traffic Impact Study, Appendix IX to the Draft EIR, pages 2, 5, 7–9, and 23). Project trip assignments to I-10 and on/off ramps were completed for use in the screening level evaluation to determine if the project traffic contribution to freeway and off-ramps is large enough for the analysis of remaining items mentioned in the July 14, 2014, letter. As discussed above, the screening level evaluation showed that the project traffic contribution to freeway and off-ramps is not large enough to warrant further analysis.

The City has determined that the project is not regionally significant, as defined by Section 15206(b)(2) of the CEQA Guidelines, since the project is not an industrial, manufacturing, or processing plant, or industrial park that plans to house more than 1,000 persons, occupy more than 40 acres of land, or encompass more than 650,000 square feet of floor area. The proposed project consists of 994 planned employees. The project area is 12.9 acres, and the total floor area of all four proposed buildings is 480,120 square feet. Therefore, the project meets none of the criteria that require it to be considered as regionally significant. Therefore, the proposed project is not of regional significance and would not change trip patterns or induce growth of trips regionally.

A cumulative analysis was undertaken for all the study surface intersections as required by LADOT Policy and Procedures. However, because the number of peak-hour trips generated by the proposed project would not exceed the applicable threshold of 100 peak-hour trips in either direction on the I-10 Freeway, the project's traffic contribution to freeways and off-ramps was determined to be not large enough to include in the analysis as per LADOT "Traffic Study Policies and Procedures" document. As a result, a cumulative analysis was determined not to be required for freeways and off-ramps.

COMMENT NO. B1-2

Again, the TIS did not include a traffic analysis of the State's highway facilities. There are 1,021/171 AM/PM cumulative peak hour trips.

RESPONSE NO. B1-2

As discussed in Response to Comment No. B1-1, the City of Los Angeles (City) has noted the necessity of a traffic analysis of the State's highway facilities. The traffic analysis was conducted per scope of study identified in the MOU signed in consultation with LADOT. Since the proposed project site is entirely within the jurisdiction of the City of Los Angeles, LADOT requires the traffic study to follow the guidelines established in its "Traffic Study Policies and Procedures" document. The most recent version of the guidelines, dated August 2014, includes a section that addresses the need for analysis of State highway facilities. The following is an excerpt from LADOT guidelines relevant to State highway facilities (refer to Section E, page 8 of Traffic Study Policies and Procedures, which is included as Appendix B of the Final EIR):

> *FREEWAY IMPACT ANALYSIS SCREENING CRITERIA*
>
> *Pursuant to the Freeway agreement executed in October 2013 between LADOT and Caltrans District 7, traffic studies may be required to conduct a focused freeway impact analysis in addition to the CMP analysis described above. If the proposed project meets any of the following criteria, the applicant will be directed to the Caltrans' Intergovernmental Review section for a determination on the need for analysis and, if necessary, the methodology to be utilized for a freeway impact analysis:*
>
> - *The project's peak hour trips would result in a 1-percent or more increase to the freeway mainline capacity of a freeway segment operating at LOS E or F, based on an assumed capacity of 2,000 vehicles per hour per lane); or*
> - *The project's peak hour trips would result in a 2-percent or more increase to the freeway mainline capacity of a freeway segment operating at LOS D (based on an assumed capacity of 2,000 vehicles per hour per lane); or*
> - *The project's peak hour trips would result in a 1-percent or more increase to the freeway mainline capacity of a freeway off-ramp operating at LOS E or F, based on an assumed ramp capacity of 1,500 vehicles per hour per lane); or*
> - *The project's peak hour trips would result in a 2-percent or more increase to the freeway mainline capacity of a freeway off-ramp operating at LOS D, based on an assumed ramp capacity of 1,500 vehicles per hour per lane).*

Accordingly, the proposed project's traffic study and existing conditions section on freeway segment analysis included an analysis of the proposed project's estimated trip generation and distribution, existing traffic counts, lane configuration and LOS. Information for freeway segment and ramp intersections was analyzed to determine if the proposed project meets the agreed upon criteria in order to proceed with freeway impact analysis using the Caltrans Guide for the Preparation of Traffic Impact Studies (latest version, December 2002). The freeway segments of I-10 EB (East of Alameda Street, and West of Alameda Street) as well as I-10 WB (East of Alameda Street, and West of Alameda Street) were analyzed. The results of this analysis indicated that the proposed project does not meet any of the criteria requiring a freeway impact analysis. At freeway LOS E or F, project trips must increase freeway peak hour volume by 100 in either direction (i.e., 1 percent of 5-lane freeway capacity, 10,000 vehicles per hour). The existing I-10 Freeway segments in the study area are operating at LOS F. The project contributes a maximum of 22 trips in both EB and WB direction of the freeway (Page IV.G-8, Table IV.

G.3) during the peak hour, which is less than the 100 trips threshold requiring additional impact analysis.

Cumulative traffic impacts are addressed in Draft EIR Section IV.G Traffic, page IV.G-17, and in the Traffic Impact Study (Appendix III IS-5 of the Draft EIR, pages 22 through 24, and Addendum to Traffic Impact Study, Appendix IX to the Draft EIR, pages 5, 7–9, and 23). The City has determined that the project is not regionally significant, as defined by Section 15206(b)(2) of the CEQA Guidelines, since the project is not an industrial, manufacturing, or processing plant, or industrial park that plans to house more than 1,000 persons, occupy more than 40 acres of land, or encompass more than 650,000 square feet of floor area. The proposed project consists of 994 planned employees. The project area is 14 acres, and the total floor area of all four proposed buildings is 480,120 square feet. Therefore, the project meets none of the criteria that require it to be considered as regionally significant. Therefore, the proposed project is not of regional significance and would not change trip patterns or induce growth of trips regionally. Section IV.G Traffic, page IV.G-17 and the Traffic Impact Study (Appendix III IS-5 of the Draft EIR, pages 22 through 24, and Addendum to Traffic Impact Study, Appendix IX to the Draft EIR, pages 5, 7–9, and 23) in the Draft EIR discuss in detail why additional cumulative analysis, including further discussion of state facilities in the vicinity of the project, would not be required under CEQA.

COMMENT NO. B1-3

In addition, the SOLA Village Project, a mixed use project consisting of 2.53 million square feet of development, is a few blocks away from the project site. Based on the size of the both of these projects, a significant cumulative traffic impact to the State facilities may occur.

RESPONSE NO. B1-3

Your comment regarding the cumulative traffic impacts from the proposed project has been noted. The criteria to determine if a traffic study should include a freeway impact analysis is outlined in LADOT's "Traffic Study Policies and Procedures" document (August 2014) (refer to Section E, page 8 of Traffic Study Policies and Procedures, Appendix B of the Final EIR). The procedures require an EIR to compare a project's traffic generation and distribution data to existing freeway traffic volumes, lane configuration, and LOS information. The SOLA Village Project will be required to conduct a freeway impact analysis if it exceeds the trip generation and distribution requirements for LADOT's Traffic Study on the freeway facilities. The Notice of Preparation (NOP) for the SOLA project (July 2014) was subsequent to that of the proposed project (June 2014). As required by Section 15125(a) of the State California Environmental Quality Act (CEQA) Guidelines, the project environmental setting was described based on the conditions as they existed at the time of publication of the NOP. The SOLA Village Project would need to consider a combination of projects along with the proposed project in the cumulative impact discussion as guided by standards of practicality and reasonableness for each of the related past, present, and probable future projects.

COMMENT NO. B1-4

As a reminder, in Caltrans' Guide "The level of service (LOS) for operating State highway facilities is based upon measures of effectiveness (MOEs). Caltrans endeavors to maintain a target LOS at the transition between LOS 'C' and LOS 'D' on State highway facilities. If an existing State highway facility is operating at less than the appropriate target LOS, the existing MOE should be maintained." The existing LOS on the freeway should be disclosed regardless of how many trips will be assigned to the highway. Currently the LOS on I-10 and I-110 are operating at or near capacity during peak hours. Additional vehicle trips from the project or related projects may contribute significant impacts to the I-10 and I-110. The decision makers should be aware of this issue and be prepared to mitigate cumulative traffic impacts in the future.

RESPONSE NO. B1-4

The City of Los Angeles has noted the comment relating to LOS and cumulative traffic impacts. To analyze cumulative traffic impacts, traffic study guidelines require an analysis of trip generation, distribution and level of service at key intersections and roadways using the list of all planned and approved projects in the vicinity of the project that would be assumed to be built prior to construction of the project. Accordingly, a list of such projects was obtained from the City and a total of five projects were identified for cumulative traffic analysis. The estimated traffic volume from these projects was added to project traffic volumes and the existing traffic volumes (multiplied by a traffic growth factor to account for any smaller projects and population growth through the opening year of the project). The intersection level of service determined with this combined volume was used to measure cumulative traffic impacts. A cumulative analysis was undertaken for all the study surface intersections as required by LADOT Policy and Procedures. However, as discussed in Response to Comment Nos. B1-1 and B1-2 above, the project's traffic contribution to freeways and off-ramps was determined to be not large enough to include in the analysis. As a result, a cumulative analysis was deemed unnecessary for freeways and off-ramps.

LOS F (more demand than capacity) criteria were used in the traffic study to determine if freeway impact analysis would be required for the proposed project. The proposed project's traffic contribution for freeway I-10 eastbound and westbound segments, east and west of Alameda Street, as well as the intersection of I-10 eastbound off ramp at Alameda Street and the intersection of I-10 westbound off ramp is no more than 22 vehicles (in terms of passenger car equivalent) in any direction during any peak hour. Considering five lanes of travel on the freeway, any traffic impact of this amount of traffic from the proposed project alone would be insignificant. Specifically, with respect to the MOE for the nearest highway on-ramps at I-10 eastbound ramps at Alameda Street and I-10 westbound ramps at Alameda Street, LOS E (at or near capacity level) criteria were used in the traffic study to determine if freeway impact analysis would be required for the project. The project's traffic contribution is no more than 22 vehicles (in terms of passenger car equivalent) in any direction during any peak hour, which does not constitute a significant impact, based on the City's criteria established in the traffic study policies and procedure per agreement with Caltrans, in relation to the baseline condition, the future baseline with project, or the future baseline with related projects. The October 2014 Addendum to the Traffic Impact Study, (Appendix IX in Volume VI of the Draft EIR) includes an analysis of I-10 freeway ramps and mainline segments (at Alameda Street) to show that the project-related 22 vehicles per hour would not be considered significant to change LOS from the existing MOE. The 22-project related trips do not include cumulative trips. The I-10 freeway segments at Alameda Street are currently at LOS E, but ramp intersections are at LOS C during the peak hours and these facilities would not worsen with project traffic. Cumulative trips on Freeway segments were not estimated as the project's contribution to freeway segments did not meet volume threshold for further analysis as per the LADOT "Traffic Study Policies and Procedures" document. The proposed project is a relocation of four light manufacturing facilities to a new location (per project plans); thus, although all 351 project-related trips were analyzed for purpose of the traffic study in accordance with the ITE Manual, the majority of the trips (over 50 percent) already occur in the baseline conditions. No trip subtraction was taken due to any existing on-street project traffic in order to assume a conservative worst-case scenario. No-project baseline conditions, as discussed in Alternative A of Chapter IV Alternatives, is based on the assumption that no project would be constructed and the existing conditions at the site would remain unchanged.

COMMENT NO. B1-5

In the spirit of mutual cooperation, we encourage the City to work with Caltrans in an effort to evaluate traffic impacts, identify potential improvements, and establish a funding mechanism that helps mitigate cumulative transportation impacts in the area.

RESPONSE NO. B1-5

Your comment encouraging mutual cooperation between the City and Caltrans is noted. The City is working with Caltrans on these issues as evidenced by inclusion of a Freeway Impact Analysis Screening Criteria in its "Traffic Study Policies and Procedures" document (August 2014).

STATE O CALIFOI A—CALIFORNIA STATE TRANSPORTATION AGENCY EDMUND G. BROWN Jr., Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 7-OFFICE OF TRANSPORTATION PLANNING
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Serious drought.
Help save water!

July 21, 2016

Ms. Srimal Hewawitharana
City of Los Angeles
200 North Spring Street, Room 750
Los Angeles, CA 90012

RE: 4051 South Alameda Street Project
Vic. LA-10/ PM 17.122
SCH # 2014061030
Ref. IGR/CEQA No. 140621AL-NOP
Ref. IGR/CEQA No. 150141AL-DEIR
IGR/CEQA No. 160636-FEIR

Dear Ms. Hewawitharana:

This letter serves as follow-up to Caltrans comment letter dated February 19, 2015. After review of the Response to Comment prepared in June 2016, Caltrans has the following comments:

The freeway impact analysis screening criteria only applies to project direct impact. Cumulative traffic impact analysis per CEQA should still be analyzed. When the Level of Service (LOS) on the I-10 and I-110 freeways is E or F during the peak period, this is an indication that the freeways are operating at or near capacity. If the related projects are adding trips to an already deficient facility, the existing LOS or Measure of Effectiveness (MOE) should be maintained, per Caltrans' Guide for the Preparation of a Traffic Impact Study. In the worst case scenario, the related projects' peak hour trips would result in a 1-percent or more increase to the freeway mainline capacity of a freeway segment and off-ramps. This may be a significant cumulative traffic impact that the Lead Agency should not be avoid.

As the owner and operator of the State facilities, Caltrans, as commenting agency under CEQA, has jurisdiction in identifying the freeway analysis that is necessary to determine the impacts of a proposed project to the State facility. Caltrans is responsible for obtaining measures that will off-set project vehicle trip generation that worsens Caltrans facilities and hence, it does not adhere to the CMP guide. MTA's Congestion Management Program acknowledges Caltrans' role and stipulates that Caltrans must be consulted by the Lead Agency.

CEQA requires a Lead Agency to determine the significance of all environmental impacts (California Public Resources Code [PRC] Section 21082.2; State CEQA Guidelines Section 15064). However, Lead Agencies may not arbitrarily establish thresholds to either create or avoid significant impacts. Thresholds must be backed by substantial evidence, which is defined

in the CEQA statute to mean "facts, reasonable assumptions predicated on facts, and expert opinion supported by facts" (CEQA Guidelines Section 15384).

The project may not have significant direct traffic impact to the State facilities. However, the project may contribute significant cumulative traffic impact to the State facilities. The "cumulative impacts' refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. From the Reef project, there are 82 related projects in the project vicinity versus only 5 projects are identified in the Response to Comment. There would be significant cumulative traffic impact when all development are built.

We understand finding a mitigation for cumulative traffic impact may be challenging, once again, we encourage the City to work with Caltrans in an effort to evaluate traffic impacts, identify potential improvements, and establish a funding mechanism that helps mitigate cumulative transportation impacts in the area. If you have any questions, please feel free to contact Alan Lin the project coordinator at (213) 897-8391 and refer to IGR/CEQA No. 160636AL-FEIR.

Sincerely,

DIANNA WATSON
Branch Chief
Community Planning & LD / IGR Review

cc: Scott Morgan, State Clearinghouse

Appendix D

Caltrans Analysis Worksheets

EXISTING CONDITIONS (YEAR 2014)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Eastbound

west of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	7,636	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 1,666 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? NO

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq BP$: FFS_{adj}

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **52.4** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* — D: **31.8** pc/mi/ln

Level of Service (LOS): LOS: **D**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

EXISTING CONDITIONS (YEAR 2014)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Westbound

west of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	11,472	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_c):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS):	BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*	[f_{LW}:	0.00	]	
		[f_{RLC}:	0.00	]	
		FFS:	52.4	mi/h	
Adjusted Free Flow Speed (FFS_{adj}):	FFS x SAF *(Eq. 12-5)*	FFS_{adj}:	52.4	mi/h	
Basic Freeway Seg. Capacity (c):	2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)*	c:	2,224	pc/h/ln	
Adj. Freeway Seg. Capacity (c_{adj}):	c x CAF *(Eq. 12-8)*	c_{adj}:	2,224	pc/h/ln	
Breakpoint (BP):	[1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)*	BP:	1,904	pc/h/ln	
Flow Rate (v_p):	$\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*	[f_{HV}:	0.965	]	
		v_p:	2,503	pc/h/ln	

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S):	If $v_p \leq BP$: FFS_{adj}	*(Eq. 12-1)*			
	If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_c) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$				
		S:	**n/a**	mi/h	
Density (D):	$D = v_p / S$ *(Eq. 12-11)*	D:	**n/a**	pc/mi/ln	
Level of Service (LOS):		LOS:	**F**		

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Eastbound

east of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	7,826	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 1,707 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? NO

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq BP$: FFS_{adj}

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **52.4** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* — D: **32.6** pc/mi/ln

Level of Service (LOS): LOS: **D**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Westbound

east of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	11,758	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_c):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 2,565 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq BP$: FFS_{adj}

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_c) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **n/a** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* — D: **n/a** pc/mi/ln

Level of Service (LOS): — LOS: **F**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

EXISTING CONDITIONS (YEAR 2014)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Eastbound

west of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	9,895	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 2,159 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? NO

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq BP$: FFS_{adj}

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **50.5** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* — D: **42.7** pc/mi/ln

Level of Service (LOS): LOS: **E**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

EXISTING CONDITIONS (YEAR 2014)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Westbound

west of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	7,246	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 1,581 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? NO

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq BP$: FFS_{adj}

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **52.4** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* — D: **30.2** pc/mi/ln

Level of Service (LOS): LOS: **D**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

EXISTING CONDITIONS (YEAR 2014)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Eastbound

east of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	10,142	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 2,213 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? NO

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq BP$: FFS_{adj}

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **49.6** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* — D: **44.6** pc/mi/ln

Level of Service (LOS): LOS: **E**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

EXISTING CONDITIONS (YEAR 2014)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Westbound

east of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	7,426	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 1,620 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? NO

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq BP$: FFS_{adj}

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **52.4** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* — D: **30.9** pc/mi/ln

Level of Service (LOS): LOS: **D**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Eastbound

west of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	7,657	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 1,670 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? NO

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq BP$: FFS_{adj}

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **52.4** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* — D: **31.9** pc/mi/ln

Level of Service (LOS): LOS: **D**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Westbound

west of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	11,478	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 2,504 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq BP$: FFS_{adj}

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **n/a** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* — D: **n/a** pc/mi/ln

Level of Service (LOS): LOS: **F**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Eastbound

east of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	7,833	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS):	BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*	[f_{LW}:	0.00	]	
		[f_{RLC}:	0.00	]	
		FFS:	52.4	mi/h	
Adjusted Free Flow Speed (FFS_{adj}):	FFS x SAF *(Eq. 12-5)*	FFS_{adj}:	52.4	mi/h	
Basic Freeway Seg. Capacity (c):	2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)*	c:	2,224	pc/h/ln	
Adj. Freeway Seg. Capacity (c_{adj}):	c x CAF *(Eq. 12-8)*	c_{adj}:	2,224	pc/h/ln	
Breakpoint (BP):	[1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)*	BP:	1,904	pc/h/ln	
Flow Rate (v_p):	$\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*	[f_{HV}:	0.965	]	
		v_p:	1,709	pc/h/ln	

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? NO

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq BP$: FFS_{adj}

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **52.4** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* D: **32.6** pc/mi/ln

Level of Service (LOS): LOS: **D**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Westbound

east of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	11,778	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 2,570 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq$ BP: FFS_{adj}

If BP < $v_p \leq$ c: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **n/a** mi/h

Density (D): D = v_p / S *(Eq. 12-11)* — D: **n/a** pc/mi/ln

Level of Service (LOS): — LOS: **F**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Eastbound

west of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	9,903	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 2,160 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? NO

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq BP$: FFS_{adj}

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **50.5** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* — D: **42.8** pc/mi/ln

Level of Service (LOS): LOS: **E**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Westbound

west of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	7,267	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 1,585 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? NO

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq BP$: FFS_{adj}

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **52.4** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* — D: **30.3** pc/mi/ln

Level of Service (LOS): LOS: **D**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Eastbound

east of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	10,164	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 2,217 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? NO

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq BP$: FFS_{adj}

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **49.5** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* — D: **44.8** pc/mi/ln

Level of Service (LOS): LOS: **E**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Westbound

east of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	7,433	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 1,622 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? NO

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq BP$: FFS_{adj}

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **52.4** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* — D: **30.9** pc/mi/ln

Level of Service (LOS): LOS: **D**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Eastbound

west of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	9,431	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_c):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS):	BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*	[f_{LW}:	0.00	]	
		[f_{RLC}:	0.00	]	
		FFS:	52.4	mi/h	
Adjusted Free Flow Speed (FFS_{adj}):	FFS x SAF *(Eq. 12-5)*	FFS_{adj}:	52.4	mi/h	
Basic Freeway Seg. Capacity (c):	2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)*	c:	2,224	pc/h/ln	
Adj. Freeway Seg. Capacity (c_{adj}):	c x CAF *(Eq. 12-8)*	c_{adj}:	2,224	pc/h/ln	
Breakpoint (BP):	[1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)*	BP:	1,904	pc/h/ln	
Flow Rate (v_p):	$\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*	[f_{HV}:	0.965	]	
		v_p:	2,057	pc/h/ln	

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? NO

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S):

If $v_p \leq BP$: FFS_{adj} *(Eq. 12-1)*

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_c) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **51.7** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* D: **39.8** pc/mi/ln

Level of Service (LOS): LOS: **E**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Westbound

west of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	14,151	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS):	BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*	[f_{LW}:	0.00	]	
		[f_{RLC}:	0.00	]	
		FFS:	52.4	mi/h	
Adjusted Free Flow Speed (FFS_{adj}):	FFS x SAF *(Eq. 12-5)*	FFS_{adj}:	52.4	mi/h	
Basic Freeway Seg. Capacity (c):	2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)*	c:	2,224	pc/h/ln	
Adj. Freeway Seg. Capacity (c_{adj}):	c x CAF *(Eq. 12-8)*	c_{adj}:	2,224	pc/h/ln	
Breakpoint (BP):	[1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)*	BP:	1,904	pc/h/ln	
Flow Rate (v_p):	$\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*	[f_{HV}:	0.965	]	
		v_p:	3,087	pc/h/ln	

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): If $v_p \leq BP$: FFS_{adj} *(Eq. 12-1)*

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **n/a** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* D: **n/a** pc/mi/ln

Level of Service (LOS): LOS: **F**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Eastbound

east of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	9,656	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_c):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS):	BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*	[f_{LW}:	0.00	]	
		[f_{RLC}:	0.00	]	
		FFS:	52.4	mi/h	
Adjusted Free Flow Speed (FFS_{adj}):	FFS x SAF *(Eq. 12-5)*	FFS_{adj}:	52.4	mi/h	
Basic Freeway Seg. Capacity (c):	2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)*	c:	2,224	pc/h/ln	
Adj. Freeway Seg. Capacity (c_{adj}):	c x CAF *(Eq. 12-8)*	c_{adj}:	2,224	pc/h/ln	
Breakpoint (BP):	[1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)*	BP:	1,904	pc/h/ln	
Flow Rate (v_p):	$\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*	[f_{HV}:	0.965	]	
		v_p:	2,107	pc/h/ln	

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? NO

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): If $v_p \leq BP$: FFS_{adj} *(Eq. 12-1)*

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_c) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **51.2** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* D: **41.1** pc/mi/ln

Level of Service (LOS): LOS: **E**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Westbound

east of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	14,501	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 3,164 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq BP$: FFS_{adj}

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **n/a** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* — D: **n/a** pc/mi/ln

Level of Service (LOS): LOS: **F**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Eastbound

west of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	12,199	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 2,661 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq BP$: FFS_{adj}

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **n/a** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* — D: **n/a** pc/mi/ln

Level of Service (LOS): LOS: **F**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Westbound

west of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	8,935	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS):	BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*	[f_{LW}:	0.00	]	
		[f_{RLC}:	0.00	]	
		FFS:	52.4	mi/h	
Adjusted Free Flow Speed (FFS_{adj}):	FFS x SAF *(Eq. 12-5)*	FFS_{adj}:	52.4	mi/h	
Basic Freeway Seg. Capacity (c):	2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)*	c:	2,224	pc/h/ln	
Adj. Freeway Seg. Capacity (c_{adj}):	c x CAF *(Eq. 12-8)*	c_{adj}:	2,224	pc/h/ln	
Breakpoint (BP):	[1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)*	BP:	1,904	pc/h/ln	
Flow Rate (v_p):	$\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*	[f_{HV}:	0.965	]	
		v_p:	1,949	pc/h/ln	

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? NO

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): If $v_p \leq BP$: FFS_{adj} *(Eq. 12-1)*

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **52.3** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* D: **37.3** pc/mi/ln

Level of Service (LOS): LOS: **E**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Eastbound

east of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	12,503	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 2,728 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): *(Eq. 12-1)*

If $v_p \leq BP$: FFS_{adj}

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **n/a** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* — D: **n/a** pc/mi/ln

Level of Service (LOS): LOS: **F**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Westbound

east of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	9,156	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS):	BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*	[f_{LW}:	0.00	]	
		[f_{RLC}:	0.00	]	
		FFS:	52.4	mi/h	
Adjusted Free Flow Speed (FFS_{adj}):	FFS x SAF *(Eq. 12-5)*	FFS_{adj}:	52.4	mi/h	
Basic Freeway Seg. Capacity (c):	2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)*	c:	2,224	pc/h/ln	
Adj. Freeway Seg. Capacity (c_{adj}):	c x CAF *(Eq. 12-8)*	c_{adj}:	2,224	pc/h/ln	
Breakpoint (BP):	[1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)*	BP:	1,904	pc/h/ln	
Flow Rate (v_p):	$\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*	[f_{HV}:	0.965	]	
		v_p:	1,997	pc/h/ln	

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? NO

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): If $v_p \leq BP$: FFS_{adj} *(Eq. 12-1)*

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **52.1** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* D: **38.3** pc/mi/ln

Level of Service (LOS): LOS: **E**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

FUTURE WITH PROJECT CONDITIONS (YEAR 2035)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Eastbound

west of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	9,452	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS):	BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*	[f_{LW}:	0.00	]	
		[f_{RLC}:	0.00	]	
		FFS:	52.4	mi/h	
Adjusted Free Flow Speed (FFS_{adj}):	FFS x SAF *(Eq. 12-5)*	FFS_{adj}:	52.4	mi/h	
Basic Freeway Seg. Capacity (c):	2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)*	c:	2,224	pc/h/ln	
Adj. Freeway Seg. Capacity (c_{adj}):	c x CAF *(Eq. 12-8)*	c_{adj}:	2,224	pc/h/ln	
Breakpoint (BP):	[1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)*	BP:	1,904	pc/h/ln	
Flow Rate (v_p):	$\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*	[f_{HV}:	0.965	]	
		v_p:	2,062	pc/h/ln	

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? NO

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S):	If $v_p \leq BP$: FFS_{adj} *(Eq. 12-1)*			
	If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$			
		S:	**51.7**	mi/h
Density (D):	$D = v_p / S$ *(Eq. 12-11)*	D:	**39.9**	pc/mi/ln
Level of Service (LOS):		LOS:	**E**	

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

FUTURE WITH PROJECT CONDITIONS (YEAR 2035)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Westbound

west of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	14,157	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS):	BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*	[f_{LW}:	0.00	]	
		[f_{RLC}:	0.00	]	
		FFS:	52.4	mi/h	
Adjusted Free Flow Speed (FFS_{adj}):	FFS x SAF *(Eq. 12-5)*	FFS_{adj}:	52.4	mi/h	
Basic Freeway Seg. Capacity (c):	2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)*	c:	2,224	pc/h/ln	
Adj. Freeway Seg. Capacity (c_{adj}):	c x CAF *(Eq. 12-8)*	c_{adj}:	2,224	pc/h/ln	
Breakpoint (BP):	[1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)*	BP:	1,904	pc/h/ln	
Flow Rate (v_p):	$\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*	[f_{HV}:	0.965	]	
		v_p:	3,089	pc/h/ln	

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S):	If $v_p \leq BP$: FFS_{adj}	*(Eq. 12-1)*			
	If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$				
		S:	**n/a**	mi/h	
Density (D):	$D = v_p / S$ *(Eq. 12-11)*	D:	**n/a**	pc/mi/ln	
Level of Service (LOS):		LOS:	**F**		

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Eastbound

east of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	9,663	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS):	BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*	[f_{LW}:	0.00	]	
		[f_{RLC}:	0.00	]	
		FFS:	52.4	mi/h	
Adjusted Free Flow Speed (FFS_{adj}):	FFS x SAF *(Eq. 12-5)*	FFS_{adj}:	52.4	mi/h	
Basic Freeway Seg. Capacity (c):	2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)*	c:	2,224	pc/h/ln	
Adj. Freeway Seg. Capacity (c_{adj}):	c x CAF *(Eq. 12-8)*	c_{adj}:	2,224	pc/h/ln	
Breakpoint (BP):	[1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)*	BP:	1,904	pc/h/ln	
Flow Rate (v_p):	$\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*	[f_{HV}:	0.965	]	
		v_p:	2,108	pc/h/ln	

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? NO

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): If $v_p \leq BP$: FFS_{adj} *(Eq. 12-1)*

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **51.2** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* D: **41.2** pc/mi/ln

Level of Service (LOS): LOS: **E**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Westbound

east of Alameda Street ***AM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	14,521	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS):	BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*	[f_{LW}:	0.00	]	
		[f_{RLC}:	0.00	]	
		FFS:	52.4	mi/h	
Adjusted Free Flow Speed (FFS_{adj}):	FFS x SAF *(Eq. 12-5)*	FFS_{adj}:	52.4	mi/h	
Basic Freeway Seg. Capacity (c):	2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)*	c:	2,224	pc/h/ln	
Adj. Freeway Seg. Capacity (c_{adj}):	c x CAF *(Eq. 12-8)*	c_{adj}:	2,224	pc/h/ln	
Breakpoint (BP):	[1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)*	BP:	1,904	pc/h/ln	
Flow Rate (v_p):	$\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*	[f_{HV}:	0.965	]	
		v_p:	3,168	pc/h/ln	

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S):	If $v_p \leq BP$: FFS_{adj}			*(Eq. 12-1)*	
	If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$				
		S:	**n/a**	mi/h	
Density (D):	$D = v_p / S$ *(Eq. 12-11)*	D:	**n/a**	pc/mi/ln	
Level of Service (LOS):		LOS:	**F**		

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

FUTURE WITH PROJECT CONDITIONS (YEAR 2035)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Eastbound

west of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	12,207	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 2,663 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): If $v_p \leq BP$: FFS_{adj} *(Eq. 12-1)*

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **n/a** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* — D: **n/a** pc/mi/ln

Level of Service (LOS): — LOS: **F**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

FUTURE WITH PROJECT CONDITIONS (YEAR 2035)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

1 I-10 Westbound

west of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	8,956	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS):	BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*	[f_{LW}:	0.00	]	
		[f_{RLC}:	0.00	]	
		FFS:	52.4	mi/h	
Adjusted Free Flow Speed (FFS_{adj}):	FFS x SAF *(Eq. 12-5)*	FFS_{adj}:	52.4	mi/h	
Basic Freeway Seg. Capacity (c):	2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)*	c:	2,224	pc/h/ln	
Adj. Freeway Seg. Capacity (c_{adj}):	c x CAF *(Eq. 12-8)*	c_{adj}:	2,224	pc/h/ln	
Breakpoint (BP):	[1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)*	BP:	1,904	pc/h/ln	
Flow Rate (v_p):	$\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*	[f_{HV}:	0.965	]	
		v_p:	1,954	pc/h/ln	

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? NO

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S):	If $v_p \leq BP$:	FFS_{adj}		*(Eq. 12-1)*	
	If $BP < v_p \leq c$:	$FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$			
		S:	**52.3**	mi/h	
Density (D):	D = v_p / S *(Eq. 12-11)*	D:	**37.4**	pc/mi/ln	
Level of Service (LOS):		LOS:	**E**		

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

FUTURE WITH PROJECT CONDITIONS (YEAR 2035)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Eastbound

east of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	12,525	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS): BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*

[f_{LW}: 0.00]
[f_{RLC}: 0.00]
FFS: 52.4 mi/h

Adjusted Free Flow Speed (FFS_{adj}): FFS x SAF *(Eq. 12-5)* — FFS_{adj}: 52.4 mi/h

Basic Freeway Seg. Capacity (c): 2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)* — c: 2,224 pc/h/ln

Adj. Freeway Seg. Capacity (c_{adj}): c x CAF *(Eq. 12-8)* — c_{adj}: 2,224 pc/h/ln

Breakpoint (BP): [1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)* — BP: 1,904 pc/h/ln

Flow Rate (v_p): $\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*

[f_{HV}: 0.965]
v_p: 2,732 pc/h/ln

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? **YES**

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S): If $v_p \leq BP$: FFS_{adj} *(Eq. 12-1)*

If $BP < v_p \leq c$: $FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$

S: **n/a** mi/h

Density (D): $D = v_p / S$ *(Eq. 12-11)* — D: **n/a** pc/mi/ln

Level of Service (LOS): LOS: **F**

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

FUTURE WITH PROJECT CONDITIONS (YEAR 2035)

4051 S. Alameda Warehouse Project

Highway Capacity Manual 6th Edition - Basic Freeway Segments Worksheet

2 I-10 Westbound

east of Alameda Street ***PM Peak Hour***

GEOMETRIC DATA INPUTS			DEMAND INPUTS		
Base Free Flow Speed (BFFS):	58.2	mi/h	Hourly Demand Volume (V):	9,163	veh/h
Mainline Lanes (N):	5	lanes	Heavy Vehicle Percentage (P_T):	3.65	%
Lane Widths:	12	ft	Peak Hour Factor (PHF):	0.950	
Right-Side Lateral Clearance:	6	ft	Capacity Adj. Factor (CAF):	1.00	
Total Ramp Density (TRD):	2.0	ramps/mi	Speed Adj. Factor (SAF):	1.00	
Terrain Type:	Level		Density at Capacity (D_C):	45.0	pc/mi/ln
			Exponent Calibration Parameter (a):	2.00	

FREE FLOW SPEED, CAPACITY, & FLOW CALCULATIONS

Free Flow Speed (FFS):	BFFS - f_{LW} - f_{RLC} - 3.22 x TRD ^ 0.84 *(Eq. 12-2)*	[f_{LW}:	0.00	]	
		[f_{RLC}:	0.00	]	
		FFS:	52.4	mi/h	
Adjusted Free Flow Speed (FFS_{adj}):	FFS x SAF *(Eq. 12-5)*	FFS_{adj}:	52.4	mi/h	
Basic Freeway Seg. Capacity (c):	2,200 + 10 x (FFS_{adj} - 50) *(Eq. 12-6)*	c:	2,224	pc/h/ln	
Adj. Freeway Seg. Capacity (c_{adj}):	c x CAF *(Eq. 12-8)*	c_{adj}:	2,224	pc/h/ln	
Breakpoint (BP):	[1,000 + 40 x (75 - FFS_{adj})] x CAF ^ 2 *(Ex. 12-6)*	BP:	1,904	pc/h/ln	
Flow Rate (v_p):	$\frac{V}{(PHF \times N \times f_{HV})}$ *(Eq. 12-9)*	[f_{HV}:	0.965	]	
		v_p:	1,999	pc/h/ln	

Flow Rate > Adjusted Freeway Segment Capacity ($v_p > c_{adj}$)? NO

SPEED, DENSITY, & LEVEL OF SERVICE

Mean Speed (S):	If $v_p \leq BP$:	FFS_{adj}		*(Eq. 12-1)*	
	If $BP < v_p \leq c$:	$FFS_{adj} - \frac{[(FFS_{adj} - c_{adj} / D_C) \times (v_p - BP)^a]}{(c_{adj} - BP)^a}$			
		S:	**52.1**	mi/h	
Density (D):	D = v_p / S *(Eq. 12-11)*	D:	**38.4**	pc/mi/ln	
Level of Service (LOS):		LOS:	**E**		

Notes: Methodology from *Highway Capacity Manual 6th Edition* , Transportation Research Board, 2016.

J1673 - 4051 S Alameda St

Vistro File: S:\...\J1673 - 4051 S Alameda St Vistro.vistro
Report File: S:\...\Ex AM.pdf

Scenario 1 Ex AM
11/12/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Alameda St & I-10 EB Ramps	Signalized	HCM 6th Edition	EB Left	0.661	20.1	C
2	Alameda St & 14th/I-10 WB Off-Ramp	Signalized	HCM 6th Edition	EB Left	0.552	18.1	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Alameda St & I-10 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	20.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.661

Intersection Setup

Name	Alameda St			Alameda St			I-10 EB Ramps					
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	1	1	0	0	0	0	0
Pocket Length [ft]	530.00	100.00	100.00	45.00	100.00	330.00	255.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			Yes			Yes			No		

Volumes

Name	Alameda St			Alameda St			I-10 EB Ramps					
Base Volume Input [veh/h]	318	882	4	1	854	289	276	0	414	0	0	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	1.00	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	0	0	0	0
Total Hourly Volume [veh/h]	318	882	4	1	854	289	276	0	414	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	1.0000	1.0000	1.0000
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]	86	240	1	0	232	79	75	0	113	0	0	0
Total Analysis Volume [veh/h]	346	959	4	1	928	314	300	0	450	0	0	0
Presence of On-Street Parking	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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	6	3	0	3	0	0	0
Auxiliary Signal Groups						3,6			3,5			
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	5	5	0	0	5	5	5	0	5	0	0	0
Maximum Green [s]	76	76	0	0	76	76	26	0	26	0	0	0
Amber [s]	3.5	3.5	0.0	0.0	3.5	3.5	3.5	0.0	3.5	0.0	0.0	0.0
All red [s]	0.5	0.5	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.0	0.0	0.0
Split [s]	23	64	0	0	41	41	46	0	46	0	0	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	3.0	3.0	0.0	3.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	5	5	0	5	0	0	0
Pedestrian Clearance [s]	0	11	0	0	11	11	11	0	11	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
Minimum Recall	No	No			No	No	No		No			
Maximum Recall	No	No			No	No	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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	R	
C, Cycle Length [s]	110	110	110	110	110	110	110	110	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00	2.00	0.00	2.00	0.00	
g_i, Effective Green Time [s]	71	71	71	48	48	83	31	54	
g / C, Green / Cycle	0.65	0.65	0.65	0.44	0.44	0.75	0.28	0.49	
(v / s)_i Volume / Saturation Flow Rate	0.40	0.29	0.29	0.00	0.29	0.22	0.19	0.31	
s, saturation flow rate [veh/h]	856	1683	1681	525	3204	1431	1603	1431	
c, Capacity [veh/h]	524	1092	1090	212	1407	1078	447	699	
d1, Uniform Delay [s]	15.78	9.52	9.52	28.61	24.40	4.27	35.26	21.03	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.15	0.11	0.33	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	6.41	1.30	1.30	0.04	2.44	0.20	1.76	3.05	
d3, Initial Queue Delay [s]	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	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.66	0.44	0.44	0.00	0.66	0.29	0.67	0.64	
d, Delay for Lane Group [s/veh]	22.19	10.81	10.82	28.65	26.84	4.48	37.03	24.08	
Lane Group LOS	C	B	B	C	C	A	D	C	
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	
50th-Percentile Queue Length [veh]	4.30	5.54	5.54	0.02	9.64	1.83	7.30	8.98	
50th-Percentile Queue Length [ft]	107.49	138.59	138.44	0.53	241.09	45.81	182.39	224.40	
95th-Percentile Queue Length [veh]	7.70	9.41	9.40	0.04	14.74	3.30	11.73	13.89	
95th-Percentile Queue Length [ft]	192.50	235.13	234.92	0.96	368.42	82.45	293.13	347.23	

Movement, Approach, & Intersection Results

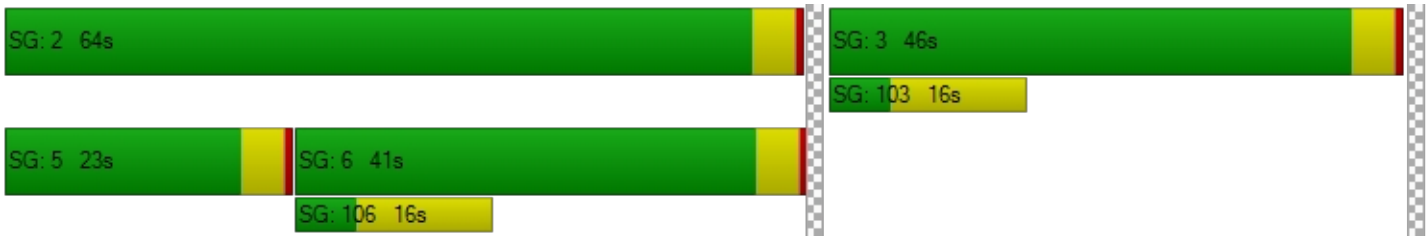
d_M, Delay for Movement [s/veh]	22.19	10.82	10.82	28.65	26.84	4.48	37.03	0.00	24.08	0.00	0.00	0.00
Movement LOS	C	B	B	C	C	A	D		C			
d_A, Approach Delay [s/veh]	13.82			21.20			29.26			0.00		
Approach LOS	B			C			C			A		
d_I, Intersection Delay [s/veh]	20.10											
Intersection LOS	C											
Intersection V/C	0.661											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	9.0	9.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	46.37	46.37	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	2.938	2.635	0.000
Crosswalk LOS	F	C	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1091	673	0	0
d_b, Bicycle Delay [s]	11.36	24.22	55.00	55.00
l_b,int, Bicycle LOS Score for Intersection	2.640	2.585	4.132	4.132
Bicycle LOS	B	B	D	D

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Alameda St & 14th/I-10 WB Off-Ramp

Control Type:	Signalized	Delay (sec / veh):	18.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.552

Intersection Setup

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
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	1	0	1
Pocket Length [ft]	70.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	220.00	100.00	350.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
Base Volume Input [veh/h]	21	795	48	22	848	29	34	30	26	466	143	61
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	0	0	0	0
Total Hourly Volume [veh/h]	21	795	48	22	848	29	34	30	26	466	143	61
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]	6	216	13	6	230	8	9	8	7	127	39	17
Total Analysis Volume [veh/h]	23	864	52	24	922	32	37	33	28	507	155	66
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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	45
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	16	0	0	16	0	0	21	0	0	21	0
Amber [s]	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0
Split [s]	0	20	0	0	20	0	0	9	0	0	16	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	11	0	0	11	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	L	C	R
C, Cycle Length [s]	45	45	45	45	45	45	45	45	45	45
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	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	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	18	18	18	18	18	18	4	11	11	11
g / C, Green / Cycle	0.41	0.41	0.41	0.41	0.41	0.41	0.08	0.25	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.04	0.27	0.27	0.04	0.29	0.29	0.06	0.20	0.20	0.05
s, saturation flow rate [veh/h]	529	1683	1650	549	1683	1663	1574	1603	1639	1431
c, Capacity [veh/h]	221	683	670	230	683	675	126	398	407	355
d1, Uniform Delay [s]	18.41	11.00	11.00	17.91	11.15	11.15	20.40	16.05	16.03	13.38
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11
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]	0.94	5.33	5.43	0.91	5.95	6.02	9.86	4.34	4.13	0.25
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	0.10	0.68	0.68	0.10	0.70	0.70	0.78	0.82	0.82	0.19
d, Delay for Lane Group [s/veh]	19.35	16.32	16.43	18.82	17.10	17.17	30.25	20.39	20.16	13.63
Lane Group LOS	B	B	B	B	B	B	C	C	C	B
Critical Lane Group	No	No	No	No	No	Yes	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	0.25	3.76	3.71	0.25	4.02	3.99	1.25	3.18	3.21	0.48
50th-Percentile Queue Length [ft]	6.22	94.08	92.70	6.34	100.62	99.76	31.22	79.52	80.27	11.94
95th-Percentile Queue Length [veh]	0.45	6.77	6.67	0.46	7.24	7.18	2.25	5.73	5.78	0.86
95th-Percentile Queue Length [ft]	11.19	169.35	166.86	11.41	181.12	179.56	56.19	143.13	144.48	21.49

Movement, Approach, & Intersection Results

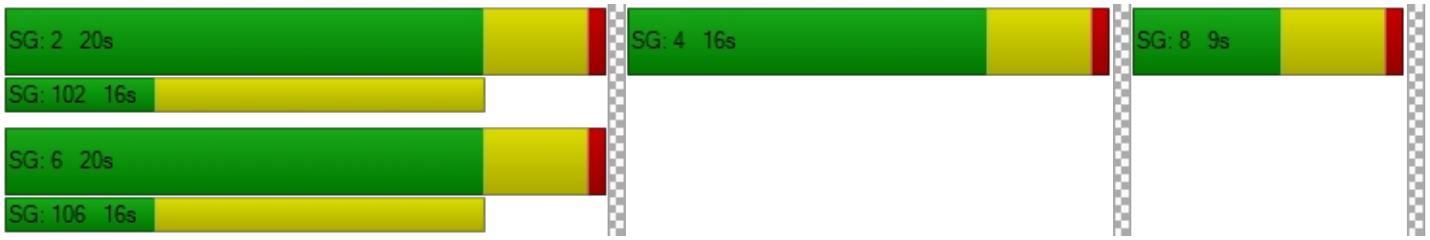
d_M, Delay for Movement [s/veh]	19.35	16.37	16.43	18.82	17.13	17.17	30.25	30.25	30.25	20.31	20.16	13.63
Movement LOS	B	B	B	B	B	B	C	C	C	C	C	B
d_A, Approach Delay [s/veh]	16.45			17.18			30.25			19.67		
Approach LOS	B			B			C			B		
d_I, Intersection Delay [s/veh]	18.06											
Intersection LOS	B											
Intersection V/C	0.552											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	14.40	14.40
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	1.862	2.334
Crosswalk LOS	F	F	A	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	711	711	222	533
d_b, Bicycle Delay [s]	9.34	9.34	17.78	12.10
l_b,int, Bicycle LOS Score for Intersection	2.334	2.366	1.721	2.761
Bicycle LOS	B	B	A	C

Sequence

Ring 1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



J1673 - 4051 S Alameda St

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Scenario 2 Ex PM
11/12/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Alameda St & I-10 EB Ramps	Signalized	HCM 6th Edition	EB Left	0.852	24.8	C
2	Alameda St & 14th/I-10 WB Off-Ramp	Signalized	HCM 6th Edition	EB Thru	0.630	22.5	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Alameda St & I-10 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	24.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.852

Intersection Setup

Name	Alameda St			Alameda St			I-10 EB Ramps					
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	1	1	0	0	0	0	0
Pocket Length [ft]	530.00	100.00	100.00	45.00	100.00	330.00	255.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			Yes			Yes			No		

Volumes

Name	Alameda St			Alameda St			I-10 EB Ramps					
Base Volume Input [veh/h]	411	962	0	0	1154	402	149	0	379	0	0	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	1.00	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	0	0	0	0
Total Hourly Volume [veh/h]	411	962	0	0	1154	402	149	0	379	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	1.0000	1.0000	1.0000
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]	112	261	0	0	314	109	40	0	103	0	0	0
Total Analysis Volume [veh/h]	447	1046	0	0	1254	437	162	0	412	0	0	0
Presence of On-Street Parking	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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	6	3	0	3	0	0	0
Auxiliary Signal Groups						3,6			3,5			
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	5	5	0	0	5	5	5	0	5	0	0	0
Maximum Green [s]	126	126	0	0	126	126	16	0	16	0	0	0
Amber [s]	3.5	3.5	0.0	0.0	3.5	3.5	3.5	0.0	3.5	0.0	0.0	0.0
All red [s]	0.5	0.5	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.0	0.0	0.0
Split [s]	50	125	0	0	75	75	25	0	25	0	0	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	3.0	3.0	0.0	3.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	5	5	0	5	0	0	0
Pedestrian Clearance [s]	0	11	0	0	11	11	11	0	11	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
Minimum Recall	No	No			No	No	No		No			
Maximum Recall	No	No			No	No	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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	R	
C, Cycle Length [s]	150	150	150	150	150	150	150	150	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00	2.00	0.00	2.00	0.00	
g_i, Effective Green Time [s]	121	121	121	90	90	115	21	52	
g / C, Green / Cycle	0.81	0.81	0.81	0.60	0.60	0.76	0.14	0.35	
(v / s)_i Volume / Saturation Flow Rate	0.65	0.31	0.31	0.00	0.39	0.31	0.10	0.29	
s, saturation flow rate [veh/h]	692	1683	1683	485	3204	1431	1603	1431	
c, Capacity [veh/h]	523	1358	1358	288	1913	1093	224	500	
d1, Uniform Delay [s]	32.59	4.07	4.07	0.00	20.01	6.03	61.72	44.57	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.23	0.50	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	16.30	0.83	0.83	0.00	1.77	1.09	9.05	14.26	
d3, Initial Queue Delay [s]	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	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.86	0.39	0.39	0.00	0.66	0.40	0.72	0.82	
d, Delay for Lane Group [s/veh]	48.89	4.89	4.89	0.00	21.78	7.12	70.77	58.83	
Lane Group LOS	D	A	A	A	C	A	E	E	
Critical Lane Group	Yes	No	No	No	No	No	No	Yes	
50th-Percentile Queue Length [veh]	5.43	4.06	4.06	0.00	14.55	4.56	6.50	16.00	
50th-Percentile Queue Length [ft]	135.78	101.61	101.61	0.00	363.68	114.02	162.56	400.07	
95th-Percentile Queue Length [veh]	9.25	7.32	7.32	0.00	20.80	8.06	10.68	22.56	
95th-Percentile Queue Length [ft]	231.33	182.90	182.90	0.00	520.06	201.58	267.11	564.09	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	48.89	4.89	4.89	0.00	21.78	7.12	70.77	0.00	58.83	0.00	0.00	0.00
Movement LOS	D	A	A	A	C	A	E		E			
d_A, Approach Delay [s/veh]	18.07			17.99			62.20			0.00		
Approach LOS	B			B			E			A		
d_I, Intersection Delay [s/veh]	24.77											
Intersection LOS	C											
Intersection V/C	0.852											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	9.0	9.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	66.27	66.27	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	3.028	2.828	0.000
Crosswalk LOS	F	C	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1613	947	0	0
d_b, Bicycle Delay [s]	2.80	20.80	75.00	75.00
l_b,int, Bicycle LOS Score for Intersection	2.791	2.955	4.132	4.132
Bicycle LOS	C	C	D	D

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Alameda St & 14th/I-10 WB Off-Ramp

Control Type:	Signalized	Delay (sec / veh):	22.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.630

Intersection Setup

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
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	1	0	1
Pocket Length [ft]	70.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	220.00	100.00	350.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
Base Volume Input [veh/h]	12	733	26	6	877	26	46	64	37	559	140	112
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	0	0	0	0
Total Hourly Volume [veh/h]	12	733	26	6	877	26	46	64	37	559	140	112
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]	3	199	7	2	238	7	13	17	10	152	38	30
Total Analysis Volume [veh/h]	13	797	28	7	953	28	50	70	40	608	152	122
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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	45
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	16	0	0	16	0	0	21	0	0	21	0
Amber [s]	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0
Split [s]	0	20	0	0	20	0	0	9	0	0	16	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	11	0	0	11	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	L	C	R
C, Cycle Length [s]	45	45	45	45	45	45	45	45	45	45
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	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	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	16	16	16	16	16	16	5	12	12	12
g / C, Green / Cycle	0.36	0.36	0.36	0.36	0.36	0.36	0.11	0.27	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.03	0.25	0.25	0.01	0.29	0.29	0.10	0.24	0.23	0.09
s, saturation flow rate [veh/h]	516	1683	1663	597	1683	1666	1588	1603	1634	1431
c, Capacity [veh/h]	188	603	596	225	603	597	172	428	436	382
d1, Uniform Delay [s]	20.69	12.30	12.30	18.08	13.11	13.11	19.91	15.86	15.80	13.24
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11
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]	0.71	6.29	6.36	0.26	11.67	11.77	18.79	6.28	5.66	0.48
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
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	0.07	0.69	0.69	0.03	0.82	0.82	0.93	0.89	0.87	0.32
d, Delay for Lane Group [s/veh]	21.40	18.59	18.67	18.33	24.78	24.88	38.70	22.14	21.46	13.72
Lane Group LOS	C	B	B	B	C	C	D	C	C	B
Critical Lane Group	No	No	No	No	No	Yes	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	0.15	3.77	3.74	0.07	5.39	5.35	2.37	3.86	3.81	0.89
50th-Percentile Queue Length [ft]	3.84	94.19	93.41	1.83	134.79	133.87	59.16	96.60	95.30	22.23
95th-Percentile Queue Length [veh]	0.28	6.78	6.73	0.13	9.20	9.15	4.26	6.96	6.86	1.60
95th-Percentile Queue Length [ft]	6.92	169.55	168.14	3.29	229.99	228.75	106.49	173.88	171.55	40.01

Movement, Approach, & Intersection Results

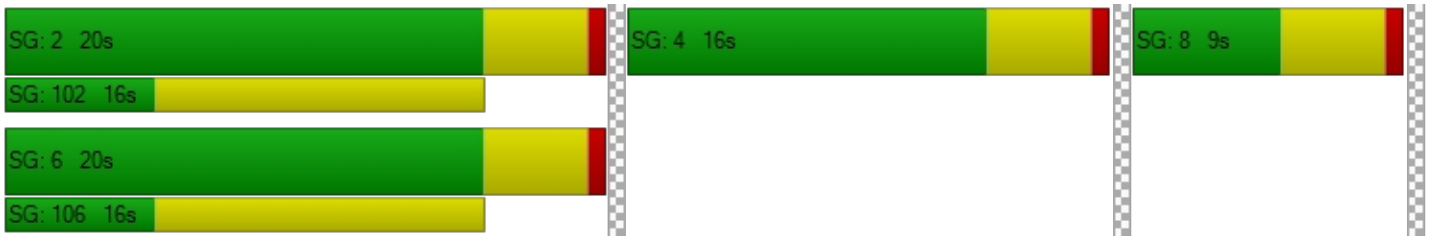
d_M, Delay for Movement [s/veh]	21.40	18.63	18.67	18.33	24.83	24.88	38.70	38.70	38.70	21.88	21.46	13.72
Movement LOS	C	B	B	B	C	C	D	D	D	C	C	B
d_A, Approach Delay [s/veh]	18.67			24.78			38.70			20.68		
Approach LOS	B			C			D			C		
d_I, Intersection Delay [s/veh]	22.51											
Intersection LOS	C											
Intersection V/C	0.630											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	14.40	14.40
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	1.870	2.346
Crosswalk LOS	F	F	A	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	711	711	222	533
d_b, Bicycle Delay [s]	9.34	9.34	17.78	12.10
l_b,int, Bicycle LOS Score for Intersection	2.251	2.375	1.824	3.015
Bicycle LOS	B	B	A	C

Sequence

Ring 1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



J1673 - 4051 S Alameda St

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Report File: S:\...\ExP AM.pdf

Scenario 3 ExP AM
11/12/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Alameda St & I-10 EB Ramps	Signalized	HCM 6th Edition	EB Left	0.686	21.0	C
2	Alameda St & 14th/I-10 WB Off-Ramp	Signalized	HCM 6th Edition	EB Left	0.559	18.4	B

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Alameda St & I-10 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	21.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.686

Intersection Setup

Name	Alameda St			Alameda St			I-10 EB Ramps					
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	1	1	0	0	0	0	0
Pocket Length [ft]	530.00	100.00	100.00	45.00	100.00	330.00	255.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			Yes			Yes			No		

Volumes

Name	Alameda St			Alameda St			I-10 EB Ramps					
Base Volume Input [veh/h]	325	890	4	1	874	289	276	0	435	0	0	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	1.00	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	0	0	0	0
Total Hourly Volume [veh/h]	325	890	4	1	874	289	276	0	435	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	1.0000	1.0000	1.0000
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]	88	242	1	0	238	79	75	0	118	0	0	0
Total Analysis Volume [veh/h]	353	967	4	1	950	314	300	0	473	0	0	0
Presence of On-Street Parking	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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	6	3	0	3	0	0	0
Auxiliary Signal Groups						3,6			3,5			
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	5	5	0	0	5	5	5	0	5	0	0	0
Maximum Green [s]	76	76	0	0	76	76	26	0	26	0	0	0
Amber [s]	3.5	3.5	0.0	0.0	3.5	3.5	3.5	0.0	3.5	0.0	0.0	0.0
All red [s]	0.5	0.5	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.0	0.0	0.0
Split [s]	23	64	0	0	41	41	46	0	46	0	0	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	3.0	3.0	0.0	3.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	5	5	0	5	0	0	0
Pedestrian Clearance [s]	0	11	0	0	11	11	11	0	11	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
Minimum Recall	No	No			No	No	No		No			
Maximum Recall	No	No			No	No	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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	R	
C, Cycle Length [s]	110	110	110	110	110	110	110	110	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00	2.00	0.00	2.00	0.00	
g_i, Effective Green Time [s]	70	70	70	47	47	83	32	55	
g / C, Green / Cycle	0.64	0.64	0.64	0.43	0.43	0.75	0.29	0.50	
(v / s)_i Volume / Saturation Flow Rate	0.41	0.29	0.29	0.00	0.30	0.22	0.19	0.33	
s, saturation flow rate [veh/h]	854	1683	1681	521	3204	1431	1603	1431	
c, Capacity [veh/h]	508	1072	1070	202	1368	1078	466	716	
d1, Uniform Delay [s]	16.89	10.21	10.21	30.09	25.70	4.27	34.11	20.54	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.15	0.11	0.36	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	7.62	1.38	1.39	0.04	2.92	0.20	1.50	3.50	
d3, Initial Queue Delay [s]	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	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.69	0.45	0.45	0.00	0.69	0.29	0.64	0.66	
d, Delay for Lane Group [s/veh]	24.51	11.60	11.60	30.13	28.63	4.48	35.60	24.04	
Lane Group LOS	C	B	B	C	C	A	D	C	
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	
50th-Percentile Queue Length [veh]	4.70	5.87	5.87	0.02	10.28	1.83	7.14	9.46	
50th-Percentile Queue Length [ft]	117.40	146.82	146.66	0.55	256.96	45.81	178.39	236.52	
95th-Percentile Queue Length [veh]	8.25	9.85	9.84	0.04	15.54	3.30	11.52	14.51	
95th-Percentile Queue Length [ft]	206.24	246.18	245.97	0.99	388.40	82.45	287.92	362.63	

Movement, Approach, & Intersection Results

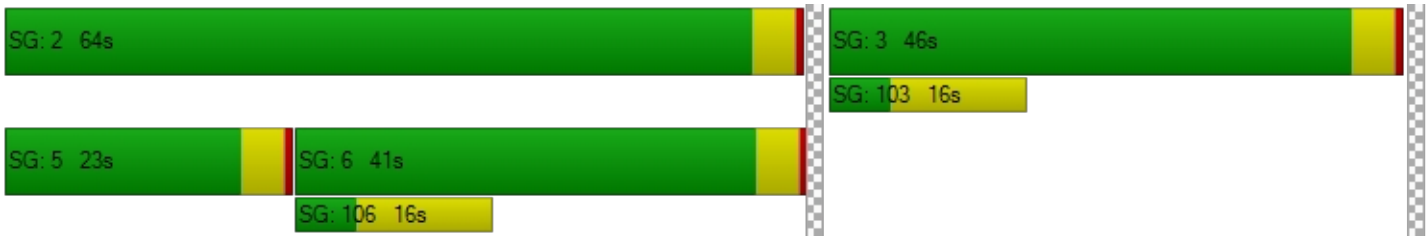
d_M, Delay for Movement [s/veh]	24.51	11.60	11.60	30.13	28.63	4.48	35.60	0.00	24.04	0.00	0.00	0.00
Movement LOS	C	B	B	C	C	A	D		C			
d_A, Approach Delay [s/veh]	15.04			22.63			28.53			0.00		
Approach LOS	B			C			C			A		
d_I, Intersection Delay [s/veh]	21.00											
Intersection LOS	C											
Intersection V/C	0.686											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	9.0	9.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	46.37	46.37	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	2.944	2.643	0.000
Crosswalk LOS	F	C	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1091	673	0	0
d_b, Bicycle Delay [s]	11.36	24.22	55.00	55.00
l_b,int, Bicycle LOS Score for Intersection	2.652	2.603	4.132	4.132
Bicycle LOS	B	B	D	D

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Alameda St & 14th/I-10 WB Off-Ramp

Control Type:	Signalized	Delay (sec / veh):	18.4
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.559

Intersection Setup

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
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	1	0	1
Pocket Length [ft]	70.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	220.00	100.00	350.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
Base Volume Input [veh/h]	21	795	48	22	848	29	34	30	26	486	143	61
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	0	0	0	0
Total Hourly Volume [veh/h]	21	795	48	22	848	29	34	30	26	486	143	61
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]	6	216	13	6	230	8	9	8	7	132	39	17
Total Analysis Volume [veh/h]	23	864	52	24	922	32	37	33	28	528	155	66
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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	45
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	16	0	0	16	0	0	21	0	0	21	0
Amber [s]	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0
Split [s]	0	20	0	0	20	0	0	9	0	0	16	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	11	0	0	11	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	L	C	R
C, Cycle Length [s]	45	45	45	45	45	45	45	45	45	45
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	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	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	18	18	18	18	18	18	4	11	11	11
g / C, Green / Cycle	0.40	0.40	0.40	0.40	0.40	0.40	0.08	0.25	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.04	0.27	0.27	0.04	0.29	0.29	0.06	0.21	0.21	0.05
s, saturation flow rate [veh/h]	529	1683	1650	549	1683	1663	1574	1603	1638	1431
c, Capacity [veh/h]	218	675	661	227	675	667	126	407	415	363
d1, Uniform Delay [s]	18.68	11.18	11.18	18.17	11.34	11.34	20.40	15.96	15.94	13.20
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11
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]	0.97	5.59	5.70	0.94	6.26	6.33	9.92	4.52	4.28	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	0.11	0.69	0.69	0.11	0.71	0.71	0.78	0.83	0.83	0.18
d, Delay for Lane Group [s/veh]	19.65	16.78	16.89	19.11	17.61	17.68	30.32	20.48	20.22	13.44
Lane Group LOS	B	B	B	B	B	B	C	C	C	B
Critical Lane Group	No	No	No	No	No	Yes	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	0.25	3.84	3.79	0.26	4.11	4.08	1.25	3.29	3.32	0.47
50th-Percentile Queue Length [ft]	6.29	96.04	94.64	6.41	102.82	101.94	31.26	82.36	82.94	11.81
95th-Percentile Queue Length [veh]	0.45	6.92	6.81	0.46	7.40	7.34	2.25	5.93	5.97	0.85
95th-Percentile Queue Length [ft]	11.33	172.88	170.36	11.54	185.08	183.50	56.27	148.26	149.29	21.26

Movement, Approach, & Intersection Results

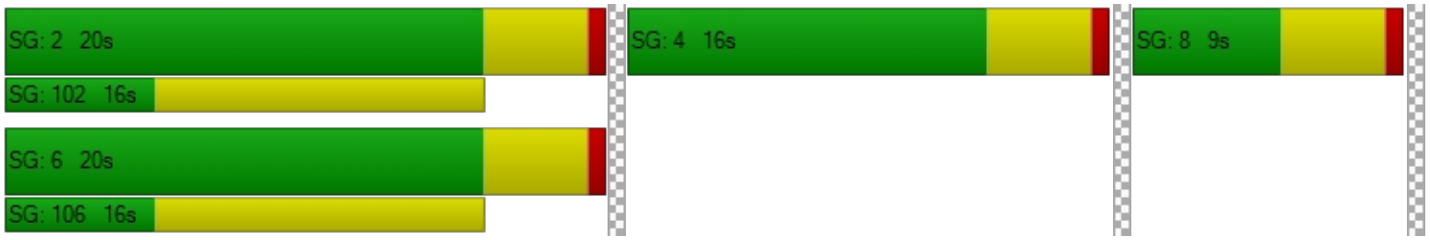
d_M, Delay for Movement [s/veh]	19.65	16.83	16.89	19.11	17.64	17.68	30.32	30.32	30.32	20.39	20.22	13.44
Movement LOS	B	B	B	B	B	B	C	C	C	C	C	B
d_A, Approach Delay [s/veh]	16.90			17.68			30.32			19.74		
Approach LOS	B			B			C			B		
d_I, Intersection Delay [s/veh]	18.42											
Intersection LOS	B											
Intersection V/C	0.559											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	14.40	14.40
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	1.862	2.339
Crosswalk LOS	F	F	A	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	711	711	222	533
d_b, Bicycle Delay [s]	9.34	9.34	17.78	12.10
l_b,int, Bicycle LOS Score for Intersection	2.334	2.366	1.721	2.795
Bicycle LOS	B	B	A	C

Sequence

Ring 1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



J1673 - 4051 S Alameda St

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Report File: S:\...\ExP PM.pdf

Scenario 4 ExP PM
11/12/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Alameda St & I-10 EB Ramps	Signalized	HCM 6th Edition	EB Left	0.868	25.7	C
2	Alameda St & 14th/I-10 WB Off-Ramp	Signalized	HCM 6th Edition	EB Thru	0.632	22.6	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Alameda St & I-10 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	25.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.868

Intersection Setup

Name	Alameda St			Alameda St			I-10 EB Ramps					
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	1	1	0	0	0	0	0
Pocket Length [ft]	530.00	100.00	100.00	45.00	100.00	330.00	255.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			Yes			Yes			No		

Volumes

Name	Alameda St			Alameda St			I-10 EB Ramps					
Base Volume Input [veh/h]	433	984	0	0	1161	402	149	0	387	0	0	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	1.00	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	0	0	0	0
Total Hourly Volume [veh/h]	433	984	0	0	1161	402	149	0	387	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	1.0000	1.0000	1.0000
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]	118	267	0	0	315	109	40	0	105	0	0	0
Total Analysis Volume [veh/h]	471	1070	0	0	1262	437	162	0	421	0	0	0
Presence of On-Street Parking	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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	6	3	0	3	0	0	0
Auxiliary Signal Groups						3,6			3,5			
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	5	5	0	0	5	5	5	0	5	0	0	0
Maximum Green [s]	126	126	0	0	126	126	16	0	16	0	0	0
Amber [s]	3.5	3.5	0.0	0.0	3.5	3.5	3.5	0.0	3.5	0.0	0.0	0.0
All red [s]	0.5	0.5	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.0	0.0	0.0
Split [s]	50	125	0	0	75	75	25	0	25	0	0	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	3.0	3.0	0.0	3.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	5	5	0	5	0	0	0
Pedestrian Clearance [s]	0	11	0	0	11	11	11	0	11	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
Minimum Recall	No	No			No	No	No		No			
Maximum Recall	No	No			No	No	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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	R	
C, Cycle Length [s]	150	150	150	150	150	150	150	150	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00	2.00	0.00	2.00	0.00	
g_i, Effective Green Time [s]	121	121	121	86	86	111	21	56	
g / C, Green / Cycle	0.81	0.81	0.81	0.58	0.58	0.74	0.14	0.37	
(v / s)_i Volume / Saturation Flow Rate	0.65	0.32	0.32	0.00	0.39	0.31	0.10	0.29	
s, saturation flow rate [veh/h]	723	1683	1683	474	3204	1431	1603	1431	
c, Capacity [veh/h]	542	1358	1358	271	1842	1061	224	532	
d1, Uniform Delay [s]	34.80	4.11	4.11	0.00	22.37	7.22	61.71	41.93	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.23	0.50	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	17.09	0.86	0.86	0.00	2.10	1.18	9.04	11.44	
d3, Initial Queue Delay [s]	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	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.87	0.39	0.39	0.00	0.69	0.41	0.72	0.79	
d, Delay for Lane Group [s/veh]	51.89	4.97	4.97	0.00	24.47	8.40	70.75	53.37	
Lane Group LOS	D	A	A	A	C	A	E	D	
Critical Lane Group	Yes	No	No	No	No	No	No	Yes	
50th-Percentile Queue Length [veh]	5.87	4.20	4.20	0.00	15.71	5.15	6.50	15.60	
50th-Percentile Queue Length [ft]	146.78	105.06	105.06	0.00	392.87	128.85	162.54	389.97	
95th-Percentile Queue Length [veh]	9.85	7.56	7.56	0.00	22.22	8.88	10.68	22.08	
95th-Percentile Queue Length [ft]	246.13	189.11	189.11	0.00	555.40	221.93	267.09	551.90	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.89	4.97	4.97	0.00	24.47	8.40	70.75	0.00	53.37	0.00	0.00	0.00
Movement LOS	D	A	A	A	C	A	E		D			
d_A, Approach Delay [s/veh]	19.31			20.33			58.20			0.00		
Approach LOS	B			C			E			A		
d_I, Intersection Delay [s/veh]	25.70											
Intersection LOS	C											
Intersection V/C	0.868											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	9.0	9.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	66.27	66.27	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	3.034	2.845	0.000
Crosswalk LOS	F	C	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1613	947	0	0
d_b, Bicycle Delay [s]	2.80	20.80	75.00	75.00
l_b,int, Bicycle LOS Score for Intersection	2.831	2.961	4.132	4.132
Bicycle LOS	C	C	D	D

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Alameda St & 14th/I-10 WB Off-Ramp

Control Type:	Signalized	Delay (sec / veh):	22.6
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.632

Intersection Setup

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
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	1	0	1
Pocket Length [ft]	70.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	220.00	100.00	350.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
Base Volume Input [veh/h]	12	733	26	6	877	26	46	64	37	566	140	112
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	0	0	0	0
Total Hourly Volume [veh/h]	12	733	26	6	877	26	46	64	37	566	140	112
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]	3	199	7	2	238	7	13	17	10	154	38	30
Total Analysis Volume [veh/h]	13	797	28	7	953	28	50	70	40	615	152	122
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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	45
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	16	0	0	16	0	0	21	0	0	21	0
Amber [s]	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0
Split [s]	0	20	0	0	20	0	0	9	0	0	16	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	11	0	0	11	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	L	C	R
C, Cycle Length [s]	45	45	45	45	45	45	45	45	45	45
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	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	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	16	16	16	16	16	16	5	12	12	12
g / C, Green / Cycle	0.36	0.36	0.36	0.36	0.36	0.36	0.11	0.27	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.03	0.25	0.25	0.01	0.29	0.29	0.10	0.24	0.24	0.09
s, saturation flow rate [veh/h]	516	1683	1663	597	1683	1666	1588	1603	1634	1431
c, Capacity [veh/h]	188	603	596	225	603	597	172	428	436	382
d1, Uniform Delay [s]	20.69	12.30	12.30	18.08	13.11	13.11	19.91	15.90	15.84	13.24
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11
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]	0.71	6.29	6.36	0.26	11.67	11.77	18.79	6.73	6.03	0.48
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
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	0.07	0.69	0.69	0.03	0.82	0.82	0.93	0.89	0.88	0.32
d, Delay for Lane Group [s/veh]	21.40	18.59	18.67	18.33	24.78	24.88	38.70	22.63	21.87	13.72
Lane Group LOS	C	B	B	B	C	C	D	C	C	B
Critical Lane Group	No	No	No	No	No	Yes	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	0.15	3.77	3.74	0.07	5.39	5.35	2.37	3.96	3.89	0.89
50th-Percentile Queue Length [ft]	3.84	94.19	93.41	1.83	134.79	133.87	59.16	98.90	97.33	22.23
95th-Percentile Queue Length [veh]	0.28	6.78	6.73	0.13	9.20	9.15	4.26	7.12	7.01	1.60
95th-Percentile Queue Length [ft]	6.92	169.55	168.14	3.29	229.99	228.75	106.49	178.02	175.19	40.01

Movement, Approach, & Intersection Results

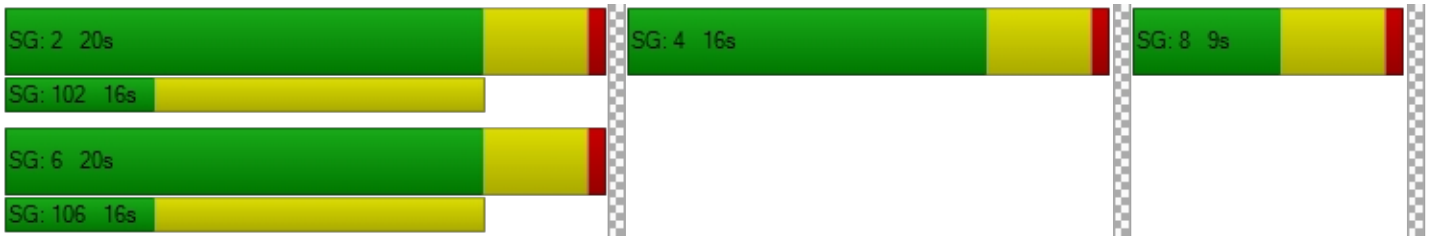
d_M, Delay for Movement [s/veh]	21.40	18.63	18.67	18.33	24.83	24.88	38.70	38.70	38.70	22.34	21.87	13.72
Movement LOS	C	B	B	B	C	C	D	D	D	C	C	B
d_A, Approach Delay [s/veh]	18.67			24.78			38.70			21.08		
Approach LOS	B			C			D			C		
d_I, Intersection Delay [s/veh]	22.63											
Intersection LOS	C											
Intersection V/C	0.632											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	14.40	14.40
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	1.870	2.348
Crosswalk LOS	F	F	A	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	711	711	222	533
d_b, Bicycle Delay [s]	9.34	9.34	17.78	12.10
l_b,int, Bicycle LOS Score for Intersection	2.251	2.375	1.824	3.026
Bicycle LOS	B	B	A	C

Sequence

Ring 1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



J1673 - 4051 S Alameda St

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Report File: S:\...\FB 2035 AM.pdf

Scenario 9 FB 2035 AM
11/12/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Alameda St & I-10 EB Ramps	Signalized	HCM 6th Edition	EB Left	0.798	27.0	C
2	Alameda St & 14th/I-10 WB Off-Ramp	Signalized	HCM 6th Edition	SB Right	0.676	31.0	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Alameda St & I-10 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	27.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.798

Intersection Setup

Name	Alameda St			Alameda St			I-10 EB Ramps					
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	1	1	0	0	0	0	0
Pocket Length [ft]	530.00	100.00	100.00	45.00	100.00	330.00	255.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			Yes			Yes			No		

Volumes

Name	Alameda St			Alameda St			I-10 EB Ramps					
Base Volume Input [veh/h]	387	1069	5	1	1035	359	342	0	503	0	0	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	1.00	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	0	0	0	0
Total Hourly Volume [veh/h]	387	1069	5	1	1035	359	342	0	503	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	1.0000	1.0000	1.0000
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]	105	290	1	0	281	98	93	0	137	0	0	0
Total Analysis Volume [veh/h]	421	1162	5	1	1125	390	372	0	547	0	0	0
Presence of On-Street Parking	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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	6	3	0	3	0	0	0
Auxiliary Signal Groups						3,6			3,5			
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	5	5	0	0	5	5	5	0	5	0	0	0
Maximum Green [s]	76	76	0	0	76	76	26	0	26	0	0	0
Amber [s]	3.5	3.5	0.0	0.0	3.5	3.5	3.5	0.0	3.5	0.0	0.0	0.0
All red [s]	0.5	0.5	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.0	0.0	0.0
Split [s]	26	76	0	0	50	50	34	0	34	0	0	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	3.0	3.0	0.0	3.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	5	5	0	5	0	0	0
Pedestrian Clearance [s]	0	11	0	0	11	11	11	0	11	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
Minimum Recall	No	No			No	No	No		No			
Maximum Recall	No	No			No	No	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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	R	
C, Cycle Length [s]	110	110	110	110	110	110	110	110	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00	2.00	0.00	2.00	0.00	
g_i, Effective Green Time [s]	72	72	72	46	46	80	30	56	
g / C, Green / Cycle	0.65	0.65	0.65	0.42	0.42	0.73	0.27	0.51	
(v / s)_i Volume / Saturation Flow Rate	0.50	0.35	0.35	0.00	0.35	0.27	0.23	0.38	
s, saturation flow rate [veh/h]	835	1683	1680	433	3204	1431	1603	1431	
c, Capacity [veh/h]	499	1103	1101	160	1340	1040	436	729	
d1, Uniform Delay [s]	26.84	10.03	10.03	33.69	28.74	5.66	37.98	21.48	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.45	0.34	0.50	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	15.84	1.82	1.83	0.07	6.46	0.94	13.55	7.01	
d3, Initial Queue Delay [s]	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	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.84	0.53	0.53	0.01	0.84	0.38	0.85	0.75	
d, Delay for Lane Group [s/veh]	42.68	11.85	11.86	33.76	35.20	6.59	51.53	28.48	
Lane Group LOS	D	B	B	C	D	A	D	C	
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	
50th-Percentile Queue Length [veh]	6.45	7.21	7.21	0.02	13.93	3.08	11.02	12.16	
50th-Percentile Queue Length [ft]	161.17	180.27	180.19	0.60	348.18	76.96	275.54	303.89	
95th-Percentile Queue Length [veh]	10.61	11.61	11.61	0.04	20.05	5.54	16.47	17.87	
95th-Percentile Queue Length [ft]	265.27	290.37	290.27	1.08	501.19	138.53	411.65	446.84	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	42.68	11.86	11.86	33.76	35.20	6.59	51.53	0.00	28.48	0.00	0.00	0.00
Movement LOS	D	B	B	C	D	A	D		C			
d_A, Approach Delay [s/veh]	20.03			27.84			37.81			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	27.03											
Intersection LOS	C											
Intersection V/C	0.798											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	9.0	9.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	46.37	46.37	0.00
I_p,int, Pedestrian LOS Score for Intersection	0.000	3.042	2.775	0.000
Crosswalk LOS	F	C	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1309	836	0	0
d_b, Bicycle Delay [s]	6.56	18.62	55.00	55.00
I_b,int, Bicycle LOS Score for Intersection	2.870	2.810	4.132	4.132
Bicycle LOS	C	C	D	D

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Alameda St & 14th/I-10 WB Off-Ramp

Control Type:	Signalized	Delay (sec / veh):	31.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.676

Intersection Setup

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
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	1	0	1
Pocket Length [ft]	70.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	220.00	100.00	350.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
Base Volume Input [veh/h]	27	970	58	27	1037	44	41	36	31	566	173	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	0	0	0	0
Total Hourly Volume [veh/h]	27	970	58	27	1037	44	41	36	31	566	173	74
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]	7	264	16	7	282	12	11	10	8	154	47	20
Total Analysis Volume [veh/h]	29	1054	63	29	1127	48	45	39	34	615	188	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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	45
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	16	0	0	16	0	0	21	0	0	21	0
Amber [s]	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0
Split [s]	0	20	0	0	20	0	0	9	0	0	16	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	11	0	0	11	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	L	C	R
C, Cycle Length [s]	45	45	45	45	45	45	45	45	45	45
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	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	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	17	17	17	17	4	12	12	12
g / C, Green / Cycle	0.38	0.38	0.38	0.38	0.38	0.38	0.09	0.27	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.07	0.34	0.34	0.06	0.35	0.35	0.08	0.25	0.25	0.06
s, saturation flow rate [veh/h]	430	1683	1650	454	1683	1659	1573	1603	1639	1431
c, Capacity [veh/h]	159	632	620	167	632	623	144	428	438	382
d1, Uniform Delay [s]	22.60	13.25	13.25	22.49	13.58	13.59	20.15	16.18	16.10	12.86
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11
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]	2.49	17.32	17.65	2.25	23.03	23.38	10.69	9.72	8.35	0.27
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	0.18	0.89	0.89	0.17	0.94	0.94	0.82	0.93	0.92	0.21
d, Delay for Lane Group [s/veh]	25.09	30.57	30.91	24.74	36.62	36.97	30.84	25.90	24.45	13.13
Lane Group LOS	C	C	C	C	D	D	C	C	C	B
Critical Lane Group	No	No	No	No	No	Yes	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	0.38	7.04	6.96	0.38	8.34	8.29	1.51	4.51	4.38	0.56
50th-Percentile Queue Length [ft]	9.59	175.97	174.04	9.43	208.60	207.26	37.81	112.84	109.57	14.06
95th-Percentile Queue Length [veh]	0.69	11.39	11.29	0.68	13.08	13.01	2.72	8.00	7.82	1.01
95th-Percentile Queue Length [ft]	17.26	284.74	282.22	16.98	327.04	325.31	68.05	199.94	195.40	25.31

Movement, Approach, & Intersection Results

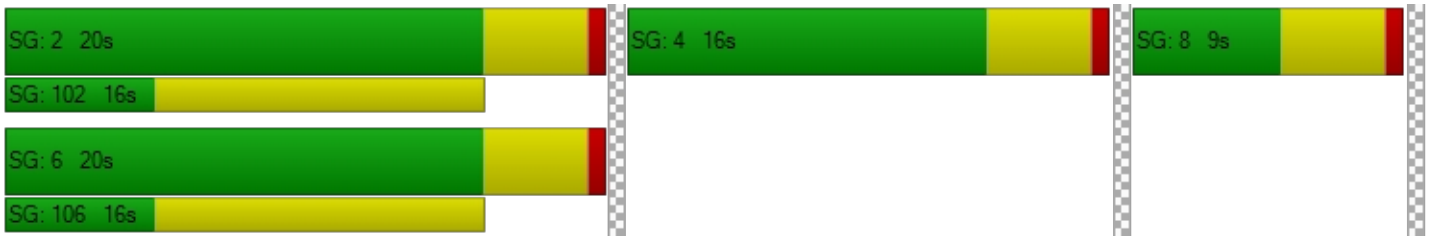
d_M, Delay for Movement [s/veh]	25.09	30.72	30.91	24.74	36.78	36.97	30.84	30.84	30.84	25.39	24.45	13.13
Movement LOS	C	C	C	C	D	D	C	C	C	C	C	B
d_A, Approach Delay [s/veh]	30.59			36.50			30.84			24.08		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	31.01											
Intersection LOS	C											
Intersection V/C	0.676											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	14.40	14.40
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	1.907	2.384
Crosswalk LOS	F	F	A	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	711	711	222	533
d_b, Bicycle Delay [s]	9.34	9.34	17.78	12.10
l_b,int, Bicycle LOS Score for Intersection	2.505	2.553	1.754	3.017
Bicycle LOS	B	B	A	C

Sequence

Ring 1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



J1673 - 4051 S Alameda St

Vistro File: S:\...\J1673 - 4051 S Alameda St Vistro.vistro
Report File: S:\...\FB 2035 PM.pdf

Scenario 10 FB 2035 PM
11/12/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Alameda St & I-10 EB Ramps	Signalized	HCM 6th Edition	EB Left	1.016	40.2	D
2	Alameda St & 14th/I-10 WB Off-Ramp	Signalized	HCM 6th Edition	EB Thru	0.766	46.5	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Alameda St & I-10 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	40.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.016

Intersection Setup

Name	Alameda St			Alameda St			I-10 EB Ramps					
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	1	1	0	0	0	0	0
Pocket Length [ft]	530.00	100.00	100.00	45.00	100.00	330.00	255.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			Yes			Yes			No		

Volumes

Name	Alameda St			Alameda St			I-10 EB Ramps					
Base Volume Input [veh/h]	498	1165	0	0	1397	489	183	0	460	0	0	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	1.00	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	0	0	0	0
Total Hourly Volume [veh/h]	498	1165	0	0	1397	489	183	0	460	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	1.0000	1.0000	1.0000
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]	135	317	0	0	380	133	50	0	125	0	0	0
Total Analysis Volume [veh/h]	541	1266	0	0	1518	532	199	0	500	0	0	0
Presence of On-Street Parking	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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	6	3	0	3	0	0	0
Auxiliary Signal Groups						3,6			3,5			
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	5	5	0	0	5	5	5	0	5	0	0	0
Maximum Green [s]	126	126	0	0	126	126	16	0	16	0	0	0
Amber [s]	3.5	3.5	0.0	0.0	3.5	3.5	3.5	0.0	3.5	0.0	0.0	0.0
All red [s]	0.5	0.5	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.0	0.0	0.0
Split [s]	53	127	0	0	74	74	23	0	23	0	0	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	3.0	3.0	0.0	3.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	5	5	0	5	0	0	0
Pedestrian Clearance [s]	0	11	0	0	11	11	11	0	11	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
Minimum Recall	No	No			No	No	No		No			
Maximum Recall	No	No			No	No	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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	R	
C, Cycle Length [s]	150	150	150	150	150	150	150	150	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00	2.00	0.00	2.00	0.00	
g_i, Effective Green Time [s]	123	123	123	72	72	95	19	70	
g / C, Green / Cycle	0.82	0.82	0.82	0.48	0.48	0.63	0.13	0.47	
(v / s)_i Volume / Saturation Flow Rate	0.66	0.38	0.38	0.00	0.47	0.37	0.12	0.35	
s, saturation flow rate [veh/h]	825	1683	1683	394	3204	1431	1603	1431	
c, Capacity [veh/h]	600	1380	1380	189	1537	905	203	668	
d1, Uniform Delay [s]	43.72	3.89	3.89	0.00	38.60	16.09	65.35	32.77	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.41	0.50	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	19.12	1.10	1.10	0.00	20.18	2.79	52.58	7.52	
d3, Initial Queue Delay [s]	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	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.90	0.46	0.46	0.00	0.99	0.59	0.98	0.75	
d, Delay for Lane Group [s/veh]	62.84	4.99	4.99	0.00	58.78	18.88	117.93	40.29	
Lane Group LOS	E	A	A	A	E	B	F	D	
Critical Lane Group	Yes	No	No	No	No	No	No	Yes	
50th-Percentile Queue Length [veh]	6.77	4.87	4.87	0.00	31.07	11.01	10.58	16.27	
50th-Percentile Queue Length [ft]	169.30	121.87	121.87	0.00	776.72	275.16	264.46	406.67	
95th-Percentile Queue Length [veh]	11.04	8.50	8.50	0.00	40.21	16.45	15.91	22.88	
95th-Percentile Queue Length [ft]	276.00	212.40	212.40	0.00	1005.26	411.18	397.81	572.03	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	62.84	4.99	4.99	0.00	58.78	18.88	117.93	0.00	40.29	0.00	0.00	0.00
Movement LOS	E	A	A	A	E	B	F		D			
d_A, Approach Delay [s/veh]	22.31			48.43			62.39			0.00		
Approach LOS	C			D			E			A		
d_I, Intersection Delay [s/veh]	40.21											
Intersection LOS	D											
Intersection V/C	1.016											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	9.0	9.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	66.27	66.27	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	3.145	2.921	0.000
Crosswalk LOS	F	C	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1640	933	0	0
d_b, Bicycle Delay [s]	2.43	21.33	75.00	75.00
l_b,int, Bicycle LOS Score for Intersection	3.050	3.251	4.132	4.132
Bicycle LOS	C	C	D	D

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Alameda St & 14th/I-10 WB Off-Ramp

Control Type:	Signalized	Delay (sec / veh):	46.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.766

Intersection Setup

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
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	1	0	1
Pocket Length [ft]	70.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	220.00	100.00	350.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
Base Volume Input [veh/h]	16	890	31	7	1065	34	56	77	45	677	169	136
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	0	0	0	0
Total Hourly Volume [veh/h]	16	890	31	7	1065	34	56	77	45	677	169	136
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]	4	242	8	2	289	9	15	21	12	184	46	37
Total Analysis Volume [veh/h]	17	967	34	8	1158	37	61	84	49	736	184	148
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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	45
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	16	0	0	16	0	0	21	0	0	21	0
Amber [s]	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0
Split [s]	0	20	0	0	20	0	0	9	0	0	16	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	11	0	0	11	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	L	C	R
C, Cycle Length [s]	45	45	45	45	45	45	45	45	45	45
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	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	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	16	16	16	16	16	16	5	12	12	12
g / C, Green / Cycle	0.36	0.36	0.36	0.36	0.36	0.36	0.11	0.27	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.04	0.30	0.30	0.02	0.36	0.36	0.12	0.29	0.28	0.10
s, saturation flow rate [veh/h]	421	1683	1663	506	1683	1665	1587	1603	1634	1431
c, Capacity [veh/h]	160	603	596	183	603	597	172	428	436	382
d1, Uniform Delay [s]	22.52	13.23	13.23	20.84	14.41	14.42	20.08	16.52	16.52	13.51
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.16	0.15	0.11
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]	1.34	12.83	12.97	0.45	35.53	35.88	73.29	47.55	39.59	0.64
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	0.11	0.83	0.83	0.04	1.00	1.00	1.13	1.08	1.06	0.39
d, Delay for Lane Group [s/veh]	23.86	26.06	26.19	21.29	49.94	50.29	93.38	64.06	56.10	14.15
Lane Group LOS	C	C	C	C	D	D	F	F	F	B
Critical Lane Group	No	No	No	No	No	Yes	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	0.22	5.69	5.65	0.09	10.56	10.50	5.09	9.31	8.53	1.11
50th-Percentile Queue Length [ft]	5.48	142.27	141.15	2.37	263.94	262.60	127.33	232.84	213.27	27.65
95th-Percentile Queue Length [veh]	0.39	9.60	9.54	0.17	15.89	15.82	9.17	14.89	13.71	1.99
95th-Percentile Queue Length [ft]	9.86	240.08	238.56	4.26	397.16	395.48	229.19	372.27	342.77	49.77

Movement, Approach, & Intersection Results

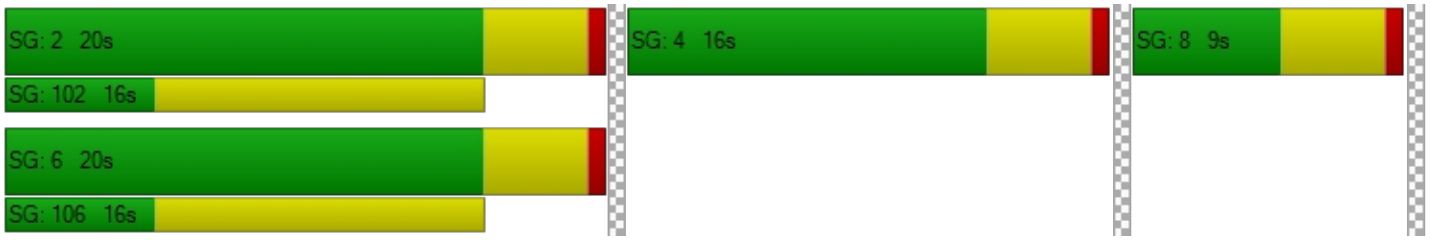
d_M, Delay for Movement [s/veh]	23.86	26.12	26.19	21.29	50.11	50.29	93.38	93.38	93.38	61.08	56.10	14.15
Movement LOS	C	C	C	C	D	D	F	F	F	E	E	B
d_A, Approach Delay [s/veh]	26.09			49.93			93.38			53.72		
Approach LOS	C			D			F			D		
d_I, Intersection Delay [s/veh]	46.54											
Intersection LOS	D											
Intersection V/C	0.766											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	14.40	14.40
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	1.914	2.398
Crosswalk LOS	F	F	A	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	711	711	222	533
d_b, Bicycle Delay [s]	9.34	9.34	17.78	12.10
l_b,int, Bicycle LOS Score for Intersection	2.399	2.552	1.880	3.322
Bicycle LOS	B	B	A	C

Sequence

Ring 1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



J1673 - 4051 S Alameda St

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Report File: S:\...\FP 2035 AM.pdf

Scenario 11 FP 2035 AM
11/12/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Alameda St & I-10 EB Ramps	Signalized	HCM 6th Edition	EB Left	0.817	28.0	C
2	Alameda St & 14th/I-10 WB Off-Ramp	Signalized	HCM 6th Edition	SB Right	0.683	31.7	C

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Alameda St & I-10 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	28.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.817

Intersection Setup

Name	Alameda St			Alameda St			I-10 EB Ramps					
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	1	1	0	0	0	0	0
Pocket Length [ft]	530.00	100.00	100.00	45.00	100.00	330.00	255.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			Yes			Yes			No		

Volumes

Name	Alameda St			Alameda St			I-10 EB Ramps					
Base Volume Input [veh/h]	394	1077	5	1	1055	359	342	0	524	0	0	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	1.00	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	0	0	0	0
Total Hourly Volume [veh/h]	394	1077	5	1	1055	359	342	0	524	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	1.0000	1.0000	1.0000
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]	107	293	1	0	287	98	93	0	142	0	0	0
Total Analysis Volume [veh/h]	428	1171	5	1	1147	390	372	0	570	0	0	0
Presence of On-Street Parking	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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	6	3	0	3	0	0	0
Auxiliary Signal Groups						3,6			3,5			
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	5	5	0	0	5	5	5	0	5	0	0	0
Maximum Green [s]	76	76	0	0	76	76	26	0	26	0	0	0
Amber [s]	3.5	3.5	0.0	0.0	3.5	3.5	3.5	0.0	3.5	0.0	0.0	0.0
All red [s]	0.5	0.5	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.0	0.0	0.0
Split [s]	26	76	0	0	50	50	34	0	34	0	0	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	3.0	3.0	0.0	3.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	5	5	0	5	0	0	0
Pedestrian Clearance [s]	0	11	0	0	11	11	11	0	11	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
Minimum Recall	No	No			No	No	No		No			
Maximum Recall	No	No			No	No	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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	R	
C, Cycle Length [s]	110	110	110	110	110	110	110	110	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00	2.00	0.00	2.00	0.00	
g_i, Effective Green Time [s]	72	72	72	46	46	80	30	56	
g / C, Green / Cycle	0.65	0.65	0.65	0.42	0.42	0.73	0.27	0.51	
(v / s)_i Volume / Saturation Flow Rate	0.52	0.35	0.35	0.00	0.36	0.27	0.23	0.40	
s, saturation flow rate [veh/h]	829	1683	1680	429	3204	1431	1603	1431	
c, Capacity [veh/h]	494	1103	1101	158	1340	1040	436	729	
d1, Uniform Delay [s]	28.12	10.07	10.08	33.88	29.05	5.66	37.98	22.05	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.45	0.34	0.50	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	18.18	1.85	1.86	0.07	7.19	0.94	13.55	8.20	
d3, Initial Queue Delay [s]	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	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.87	0.53	0.53	0.01	0.86	0.38	0.85	0.78	
d, Delay for Lane Group [s/veh]	46.29	11.92	11.93	33.95	36.24	6.59	51.53	30.25	
Lane Group LOS	D	B	B	C	D	A	D	C	
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	
50th-Percentile Queue Length [veh]	6.84	7.30	7.30	0.02	14.45	3.08	11.02	13.15	
50th-Percentile Queue Length [ft]	171.00	182.47	182.40	0.60	361.29	76.96	275.54	328.68	
95th-Percentile Queue Length [veh]	11.13	11.73	11.73	0.04	20.69	5.54	16.47	19.09	
95th-Percentile Queue Length [ft]	278.24	293.23	293.14	1.08	517.15	138.53	411.65	477.34	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	46.29	11.93	11.93	33.95	36.24	6.59	51.53	0.00	30.25	0.00	0.00	0.00
Movement LOS	D	B	B	C	D	A	D		C			
d_A, Approach Delay [s/veh]	21.10			28.72			38.65			0.00		
Approach LOS	C			C			D			A		
d_I, Intersection Delay [s/veh]	28.02											
Intersection LOS	C											
Intersection V/C	0.817											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	9.0	9.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	46.37	46.37	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	3.048	2.789	0.000
Crosswalk LOS	F	C	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1309	836	0	0
d_b, Bicycle Delay [s]	6.56	18.62	55.00	55.00
l_b,int, Bicycle LOS Score for Intersection	2.883	2.828	4.132	4.132
Bicycle LOS	C	C	D	D

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Alameda St & 14th/I-10 WB Off-Ramp

Control Type:	Signalized	Delay (sec / veh):	31.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.683

Intersection Setup

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
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	1	0	1
Pocket Length [ft]	70.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	220.00	100.00	350.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
Base Volume Input [veh/h]	27	970	58	27	1037	44	41	36	31	586	173	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	0	0	0	0
Total Hourly Volume [veh/h]	27	970	58	27	1037	44	41	36	31	586	173	74
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]	7	264	16	7	282	12	11	10	8	159	47	20
Total Analysis Volume [veh/h]	29	1054	63	29	1127	48	45	39	34	637	188	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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	45
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	16	0	0	16	0	0	21	0	0	21	0
Amber [s]	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0
Split [s]	0	20	0	0	20	0	0	9	0	0	16	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	11	0	0	11	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	L	C	R
C, Cycle Length [s]	45	45	45	45	45	45	45	45	45	45
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	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	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	17	17	17	17	4	12	12	12
g / C, Green / Cycle	0.38	0.38	0.38	0.38	0.38	0.38	0.09	0.27	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.07	0.34	0.34	0.06	0.35	0.35	0.08	0.26	0.25	0.06
s, saturation flow rate [veh/h]	430	1683	1650	454	1683	1659	1573	1603	1638	1431
c, Capacity [veh/h]	159	632	620	167	632	623	144	428	438	382
d1, Uniform Delay [s]	22.60	13.25	13.25	22.49	13.58	13.59	20.15	16.33	16.24	12.86
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11
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]	2.49	17.32	17.65	2.25	23.03	23.38	10.69	13.15	10.73	0.27
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	0.18	0.89	0.89	0.17	0.94	0.94	0.82	0.96	0.95	0.21
d, Delay for Lane Group [s/veh]	25.09	30.57	30.91	24.74	36.62	36.97	30.84	29.48	26.97	13.13
Lane Group LOS	C	C	C	C	D	D	C	C	C	B
Critical Lane Group	No	No	No	No	No	Yes	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	0.38	7.04	6.96	0.38	8.34	8.29	1.51	5.05	4.79	0.56
50th-Percentile Queue Length [ft]	9.59	175.97	174.04	9.43	208.60	207.26	37.81	126.23	119.78	14.06
95th-Percentile Queue Length [veh]	0.69	11.39	11.29	0.68	13.08	13.01	2.72	8.73	8.38	1.01
95th-Percentile Queue Length [ft]	17.26	284.74	282.22	16.98	327.04	325.31	68.05	218.36	209.52	25.31

Movement, Approach, & Intersection Results

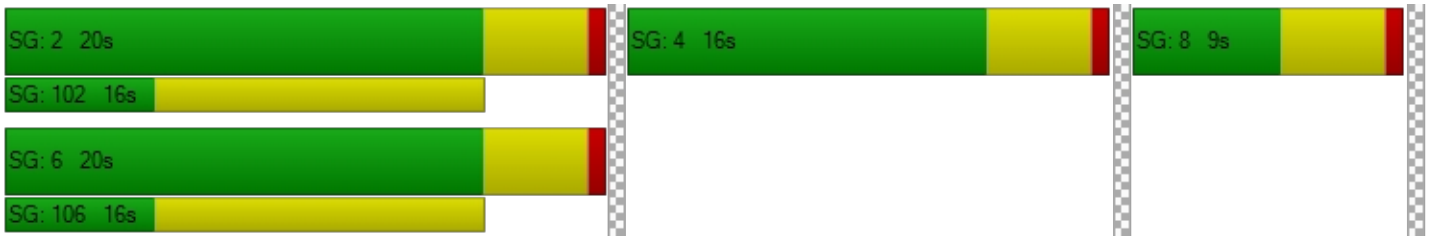
d_M, Delay for Movement [s/veh]	25.09	30.72	30.91	24.74	36.78	36.97	30.84	30.84	30.84	28.59	26.97	13.13
Movement LOS	C	C	C	C	D	D	C	C	C	C	C	B
d_A, Approach Delay [s/veh]	30.59			36.50			30.84			26.89		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	31.72											
Intersection LOS	C											
Intersection V/C	0.683											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	14.40	14.40
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	1.907	2.389
Crosswalk LOS	F	F	A	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	711	711	222	533
d_b, Bicycle Delay [s]	9.34	9.34	17.78	12.10
l_b,int, Bicycle LOS Score for Intersection	2.505	2.553	1.754	3.053
Bicycle LOS	B	B	A	C

Sequence

Ring 1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



J1673 - 4051 S Alameda St

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Report File: S:\...\FP 2035 PM.pdf

Scenario 12 FP 2035 PM
11/12/2018

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Alameda St & I-10 EB Ramps	Signalized	HCM 6th Edition	EB Left	1.039	43.3	D
2	Alameda St & 14th/I-10 WB Off-Ramp	Signalized	HCM 6th Edition	EB Thru	0.768	47.4	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. for all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Alameda St & I-10 EB Ramps

Control Type:	Signalized	Delay (sec / veh):	43.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.039

Intersection Setup

Name	Alameda St			Alameda St			I-10 EB Ramps					
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	1	1	0	0	0	0	0
Pocket Length [ft]	530.00	100.00	100.00	45.00	100.00	330.00	255.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No					
Crosswalk	No			Yes			Yes			No		

Volumes

Name	Alameda St			Alameda St			I-10 EB Ramps					
Base Volume Input [veh/h]	520	1187	0	0	1404	489	183	0	468	0	0	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	1.00	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	0	0	0	0
Total Hourly Volume [veh/h]	520	1187	0	0	1404	489	183	0	468	0	0	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	1.0000	0.9200	1.0000	1.0000	1.0000
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]	141	323	0	0	382	133	50	0	127	0	0	0
Total Analysis Volume [veh/h]	565	1290	0	0	1526	532	199	0	509	0	0	0
Presence of On-Street Parking	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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	150
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permiss	Permiss	Overlap	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss
Signal group	5	2	0	0	6	6	3	0	3	0	0	0
Auxiliary Signal Groups						3,6			3,5			
Lead / Lag	Lead	-	-	-	-	-	Lead	-	-	-	-	-
Minimum Green [s]	5	5	0	0	5	5	5	0	5	0	0	0
Maximum Green [s]	126	126	0	0	126	126	16	0	16	0	0	0
Amber [s]	3.5	3.5	0.0	0.0	3.5	3.5	3.5	0.0	3.5	0.0	0.0	0.0
All red [s]	0.5	0.5	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.0	0.0	0.0
Split [s]	53	127	0	0	74	74	23	0	23	0	0	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	3.0	3.0	0.0	3.0	0.0	0.0	0.0
Walk [s]	0	5	0	0	5	5	5	0	5	0	0	0
Pedestrian Clearance [s]	0	11	0	0	11	11	11	0	11	0	0	0
Rest In Walk		No			No		No					
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0
Minimum Recall	No	No			No	No	No		No			
Maximum Recall	No	No			No	No	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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	R	
C, Cycle Length [s]	150	150	150	150	150	150	150	150	
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	0.00	2.00	2.00	2.00	2.00	0.00	2.00	0.00	
g_i, Effective Green Time [s]	123	123	123	70	70	93	19	72	
g / C, Green / Cycle	0.82	0.82	0.82	0.47	0.47	0.62	0.13	0.48	
(v / s)_i Volume / Saturation Flow Rate	0.67	0.38	0.38	0.00	0.48	0.37	0.12	0.36	
s, saturation flow rate [veh/h]	843	1683	1683	385	3204	1431	1603	1431	
c, Capacity [veh/h]	617	1380	1380	180	1499	888	203	685	
d1, Uniform Delay [s]	43.56	3.94	3.94	0.00	39.94	17.16	65.39	31.65	
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.41	0.50	
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
d2, Incremental Delay [s]	20.66	1.14	1.14	0.00	27.82	2.98	52.73	7.16	
d3, Initial Queue Delay [s]	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	
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.92	0.47	0.47	0.00	1.02	0.60	0.98	0.74	
d, Delay for Lane Group [s/veh]	64.22	5.07	5.07	0.00	67.76	20.14	118.12	38.80	
Lane Group LOS	E	A	A	A	F	C	F	D	
Critical Lane Group	Yes	No	No	No	No	No	No	Yes	
50th-Percentile Queue Length [veh]	7.37	5.03	5.03	0.00	32.64	11.47	10.59	16.26	
50th-Percentile Queue Length [ft]	184.20	125.66	125.66	0.00	816.04	286.68	264.69	406.41	
95th-Percentile Queue Length [veh]	11.82	8.70	8.70	0.00	42.61	17.02	15.92	22.87	
95th-Percentile Queue Length [ft]	295.49	217.58	217.58	0.00	1065.36	425.52	398.09	571.72	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	64.22	5.07	5.07	0.00	67.76	20.14	118.12	0.00	38.80	0.00	0.00	0.00
Movement LOS	E	A	A	A	F	C	F		D			
d_A, Approach Delay [s/veh]	23.09			55.45			61.09			0.00		
Approach LOS	C			E			E			A		
d_I, Intersection Delay [s/veh]	43.32											
Intersection LOS	D											
Intersection V/C	1.039											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	9.0	9.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	66.27	66.27	0.00
l_p,int, Pedestrian LOS Score for Intersection	0.000	3.151	2.939	0.000
Crosswalk LOS	F	C	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1640	933	0	0
d_b, Bicycle Delay [s]	2.43	21.33	75.00	75.00
l_b,int, Bicycle LOS Score for Intersection	3.090	3.257	4.132	4.132
Bicycle LOS	C	C	D	D

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: Alameda St & 14th/I-10 WB Off-Ramp

Control Type:	Signalized	Delay (sec / veh):	47.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.768

Intersection Setup

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
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	1	0	1
Pocket Length [ft]	70.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00	220.00	100.00	350.00
Speed [mph]	35.00			35.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Alameda St			Alameda St			14th St			I-10 WB Off-Ramp/14th St		
Base Volume Input [veh/h]	16	890	31	7	1065	34	56	77	45	684	169	136
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	0	0	0	0
Total Hourly Volume [veh/h]	16	890	31	7	1065	34	56	77	45	684	169	136
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]	4	242	8	2	289	9	15	21	12	186	46	37
Total Analysis Volume [veh/h]	17	967	34	8	1158	37	61	84	49	743	184	148
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
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner 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]	45
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Split	Split	Split	Split	Split	Split
Signal group	0	2	0	0	6	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	5	0	0	5	0	0	5	0	0	5	0
Maximum Green [s]	0	16	0	0	16	0	0	21	0	0	21	0
Amber [s]	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0	0.0	3.5	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	0.0
Split [s]	0	20	0	0	20	0	0	9	0	0	16	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	11	0	0	11	0	0	11	0	0	11	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		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

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	L	C	R
C, Cycle Length [s]	45	45	45	45	45	45	45	45	45	45
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	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	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	16	16	16	16	16	16	5	12	12	12
g / C, Green / Cycle	0.36	0.36	0.36	0.36	0.36	0.36	0.11	0.27	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.04	0.30	0.30	0.02	0.36	0.36	0.12	0.29	0.28	0.10
s, saturation flow rate [veh/h]	421	1683	1663	506	1683	1665	1587	1603	1634	1431
c, Capacity [veh/h]	160	603	596	183	603	597	172	428	436	382
d1, Uniform Delay [s]	22.52	13.23	13.23	20.84	14.41	14.42	20.08	16.52	16.52	13.51
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.16	0.15	0.11
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]	1.34	12.83	12.97	0.45	35.53	35.88	73.29	50.75	42.64	0.64
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	0.11	0.83	0.83	0.04	1.00	1.00	1.13	1.08	1.06	0.39
d, Delay for Lane Group [s/veh]	23.86	26.06	26.19	21.29	49.94	50.29	93.38	67.27	59.15	14.15
Lane Group LOS	C	C	C	C	D	D	F	F	F	B
Critical Lane Group	No	No	No	No	No	Yes	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	0.22	5.69	5.65	0.09	10.56	10.50	5.09	9.69	8.90	1.11
50th-Percentile Queue Length [ft]	5.48	142.27	141.15	2.37	263.94	262.60	127.33	242.35	222.47	27.65
95th-Percentile Queue Length [veh]	0.39	9.60	9.54	0.17	15.89	15.82	9.17	15.45	14.25	1.99
95th-Percentile Queue Length [ft]	9.86	240.08	238.56	4.26	397.16	395.48	229.19	386.37	356.36	49.77

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	23.86	26.12	26.19	21.29	50.11	50.29	93.38	93.38	93.38	64.21	59.15	14.15
Movement LOS	C	C	C	C	D	D	F	F	F	E	E	B
d_A, Approach Delay [s/veh]	26.09			49.93			93.38			56.46		
Approach LOS	C			D			F			E		
d_I, Intersection Delay [s/veh]	47.40											
Intersection LOS	D											
Intersection V/C	0.768											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	9.0	9.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	14.40	14.40
l_p,int, Pedestrian LOS Score for Intersection	0.000	0.000	1.914	2.399
Crosswalk LOS	F	F	A	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	711	711	222	533
d_b, Bicycle Delay [s]	9.34	9.34	17.78	12.10
l_b,int, Bicycle LOS Score for Intersection	2.399	2.552	1.880	3.333
Bicycle LOS	B	B	A	C

Sequence

Ring 1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-